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Havre Southeast Arterial Route Location Study

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Havre Southeast Arterial Route Location Study



Robert Peccia & Associates
HELENA — HAVRE

HAVRE, MONTANA
SOUTHEAST ARTERIAL ROUTE LOCATION STUDY

FOR THE
MONTANA DEPARTMENT OF HIGHWAYS

HELENA, MONTANA

In cooperation with the
Department of Transportation
Federal Highway Administration

By:
ROBERT PECCIA & ASSOCIATES
HELENA, MONTANA
February, 1980

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February 21, 1980

Gordon L. Larson, Supervisor
Consultant Design Section
Montana Department of Highways
2701 Prospect
Helena, Montana 59601

Dear Mr. Larson:

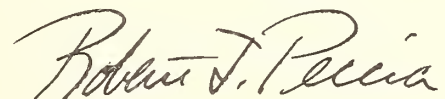
Transmitted with this letter are copies of the Draft Location Study Report for the Southeast Arterial in Havre, Montana.

This report contains information on the investigations that have been done to establish a desirable arterial route in this part of Havre and recommendations on the type and location of the preferred facility. A companion report entitled "Havre Southeast Arterial Environmental Assessment" contains information on existing environmental conditions and anticipated environmental impacts.

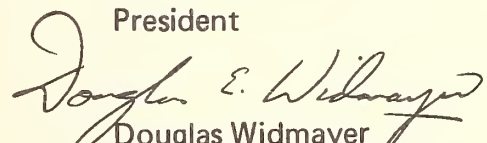
We have personal interest in this study due to our involvement in Havre for the past several years. Because of this we have made every attempt to keep the people of Havre informed as the study developed, and to make judgments that are in Havre's best interests. Projects of this nature, however, often become controversial because of the major commitments involved and the impacts that may result. This project is no exception and we would expect some controversy to arise during the public review phase. We have done our best to remain objective and to recommend an alternative that will provide this badly needed facility while minimizing adverse impacts.

We appreciate the reviews that have been done by the Department of Highways and the Federal Highway Administration, and your cooperation during this phase of the project. We also sincerely appreciate the opportunity to work with the people of Havre, and to provide these services to them.

Yours very truly,



Robert J. Peccia
President



Douglas E. Widmayer
Project Engineer

RJP/gp



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HAVRE SOUTHEAST ARTERIAL

LOCATION STUDY REPORT

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Havre Southeast Arterial Location Study - Public Meeting Summary

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CHAPTER I

Introduction and Project Scope

- A. AUTHORIZATION
- B. PURPOSE OF PROJECT
- C. DESCRIPTION AND STUDY CORRIDOR
- D. ORGANIZATION



CHAPTER I

INTRODUCTION AND PROJECT SCOPE

A. AUTHORIZATION

At the request of the City of Havre, Montana, the Montana Department of Highways initiated a project to establish the location of an arterial route in the southeastern part of the city. The project was to follow a general corridor beginning near Fifth Avenue and Sagebrush Drive and to extend easterly and northerly to Fourteenth Avenue, and was to be funded through Federal Aid Urban Funds.

To assist in conducting the study, the Department of Highways made the decision to retain a consulting engineering firm. The firm chosen to provide these services was Robert Peccia and Associates of Helena and Havre.

A preliminary scope of work for the project was prepared by the Consultant and reviewed by the Montana Department of Highways and local officials in Havre. The final scope of services to be provided under this contract is a combination of these efforts.

B. PURPOSE OF PROJECT

The Havre area has witnessed substantial growth in the past decade. This growth has spurred development around the City of Havre and has taxed the capacities of the transportation system, water supply, wastewater collection and disposal and other utilities. Because of utility limitations in other parts of Havre, much of the growth is occurring in the southeastern part of Havre. Recognizing that subdivision activity in the area may preclude the location of an arterial street in the area, thereby reducing the efficiency of the transportation system, the Havre community requested that a location study be done. The benefits expected from this location study include the ability to reserve right-of-way for the proposed arterial through the subdivision process in lieu of purchase, the continuity of the major street network, and the advantage for the residents of knowing beforehand where the arterial would be located.

C. DESCRIPTION AND STUDY CORRIDOR

Havre is the largest town on the highline and as such draws trade from a large area extending from Shelby to the west, Malta to the east and into Canada. This large trade area has resulted in substantial development in Havre, including a major shopping center. Because of its strategic location in the trade area and due to anticipated developments in energy in the area, Havre is expected to continue its growth cycle.

To provide for transportation needs in a growing community such as Havre requires foresight and planning. The overwhelmingly dominant mode of transportation is the private automobile and it is expected to be so for the foreseeable future. Efficiency of automotive traffic is heavily

dependent upon the type of facility on which the vehicle travels. To provide the proper combination of street network in Havre, an arterial with appropriate access connections is badly needed in the southeast portion of the city. Without this arterial, the functions of handling through traffic and providing land access will be handled poorly.

The proposed arterial would be a "limited access" facility allowing access to occur only at street intersections and other major traffic access situations. By providing a limited access facility, the future traffic carrying capacity and efficiency of the arterial is assured, and strip development along the arterial would be discouraged.

The location of the proposed arterial has been narrowed to a specific corridor to serve this part of Havre. Figure 1 shows the approximate corridor under scrutiny.

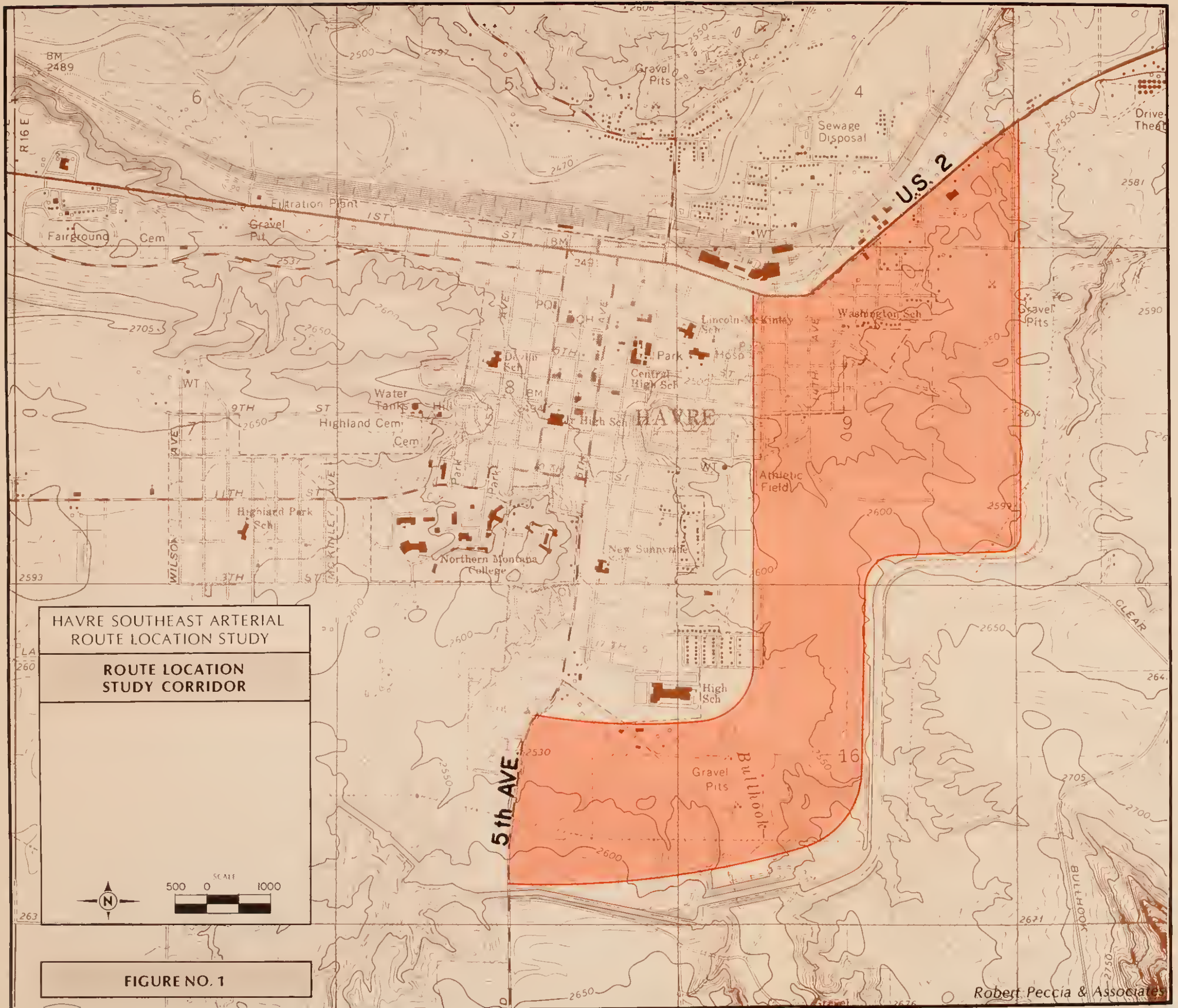
D. ORGANIZATION

Priorities for Federal Aid Urban projects are established by the local governing bodies with concurrence by the Department of Highways. The Department of Highways has the responsibility for conducting this route location study, and may either conduct the study within the Department of Highways, contract to local agencies, or contract to a private firm. At the request of the City of Havre, the Department of Highways chose to contract the study to a private consulting firm.

Federal Aid Urban funds administered by the U.S. Department of Transportation, Federal Highway Administration are being used for the study, and the Federal Highway Administration also monitors the study.

The Consultant presents periodic progress reports and findings to the Department of Highways, and reviews policy decisions with the City of Havre and Hill County. The Havre-Hill City-County Planning Board is also kept informed on the study. Public meetings are held to keep the citizens of Havre and Hill County informed, and to solicit their comments. The final recommendations for the route location will be made by the Consultant with concurrence from Havre, Hill County and the Department of Highways.

This project is on a proposed Federal Aid Urban route and the construction is under the jurisdiction of the Department of Highways. Maintenance responsibility will be under the jurisdiction of the City of Havre and Hill County.



HAVRE SOUTHEAST ARTERIAL
ROUTE LOCATION STUDY

ROUTE LOCATION
STUDY CORRIDOR



FIGURE NO. 1

CHAPTER II

Existing Situation

- A. MAJOR STREET NETWORK
- B. TRAFFIC VOLUMES
- C. LAND USE AND OWNERSHIP
- D. DEVELOPMENT



CHAPTER II

EXISTING SITUATION

A. MAJOR STREET NETWORK

Although a transportation study for Havre has not been done and a formal major street network designated, there are streets that are obviously considered to be of major importance. The most heavily traveled and the most important route is U.S. 2, also known as First Street within the Havre City Limits. This route was reconstructed in 1978 to a four-lane 71-foot wide street, and handles both through traffic and local traffic. Fifth Avenue is the next most heavily traveled street with traffic remaining fairly heavy from U.S. 2 to the Bull Hook Road intersection. Fifth Avenue is a two-lane 44-foot wide street.

Other major streets include Tenth Street west of Fifth Avenue (very little traffic occurs east of Fifth Avenue), Third Avenue, Second Street and Thirteenth Street.

B. TRAFFIC VOLUMES

Existing traffic volumes were obtained from a comprehensive traffic count program conducted by the Montana Department of Highways in 1979, and supplemented by traffic counts done by the Consultant. Traffic volumes on the major streets in Havre are shown on Figure 2 "*Existing Traffic Volumes*". It can be noted from this figure that U.S. 2 and Fifth Avenue carry the highest traffic volumes by far.

C. LAND USE AND OWNERSHIP

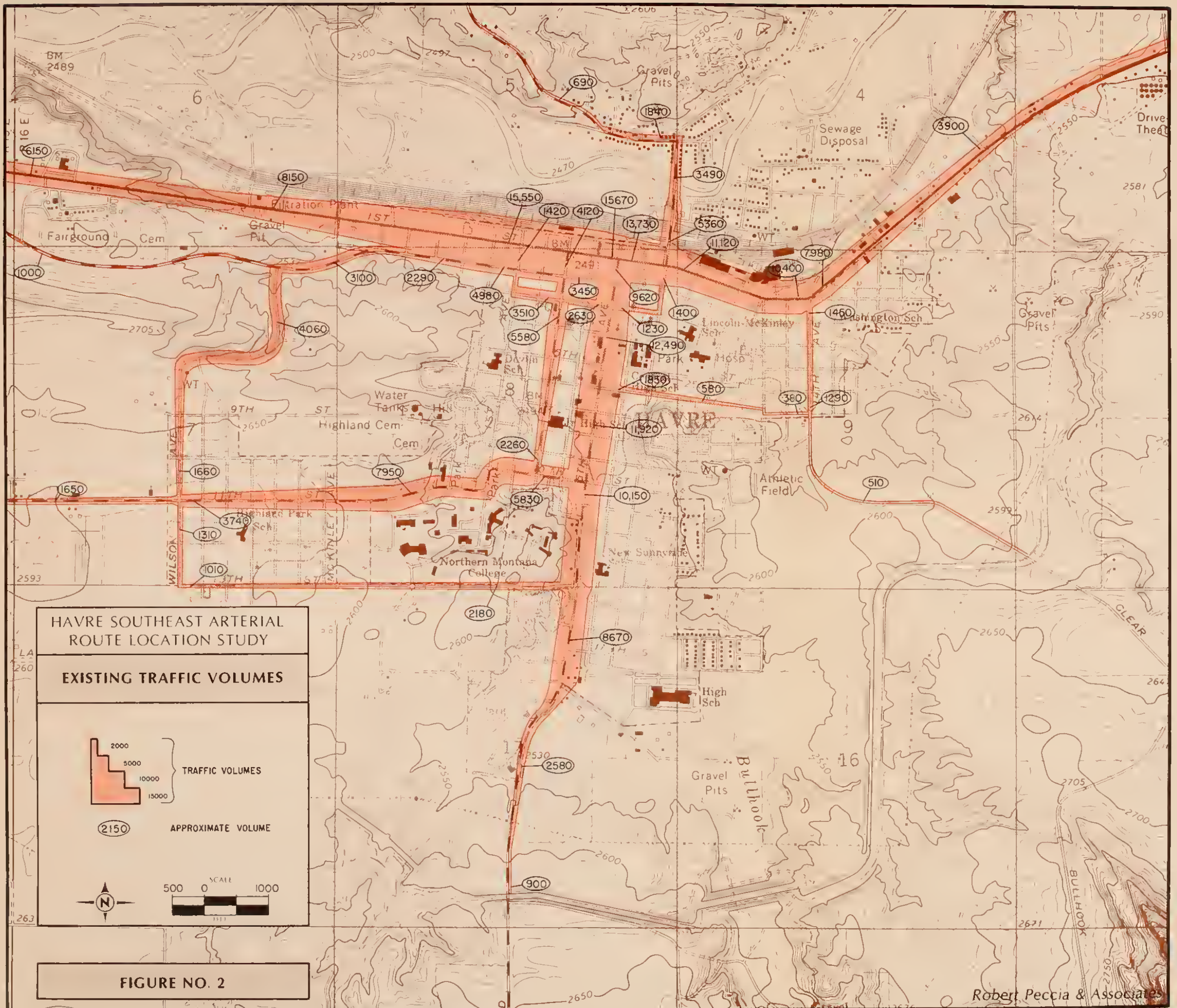
A land use and ownership inventory was conducted in the corridor that is to accommodate the proposed bypass. The inventory is current as of November, 1979. Land use categories used are those contained in the Comprehensive Plan.

The existing land uses and ownership are shown in Figure 3.

D. DEVELOPMENT

Anticipated development for the corridor area was estimated on the basis of current proposals and preliminary plans obtained from the land owners. The proposed developments were used to assess the impact that the arterial route would have on the proposed developments, and to estimate future traffic generation for the area.

The anticipated developments are shown in Figure 3 and are listed in Table 1.



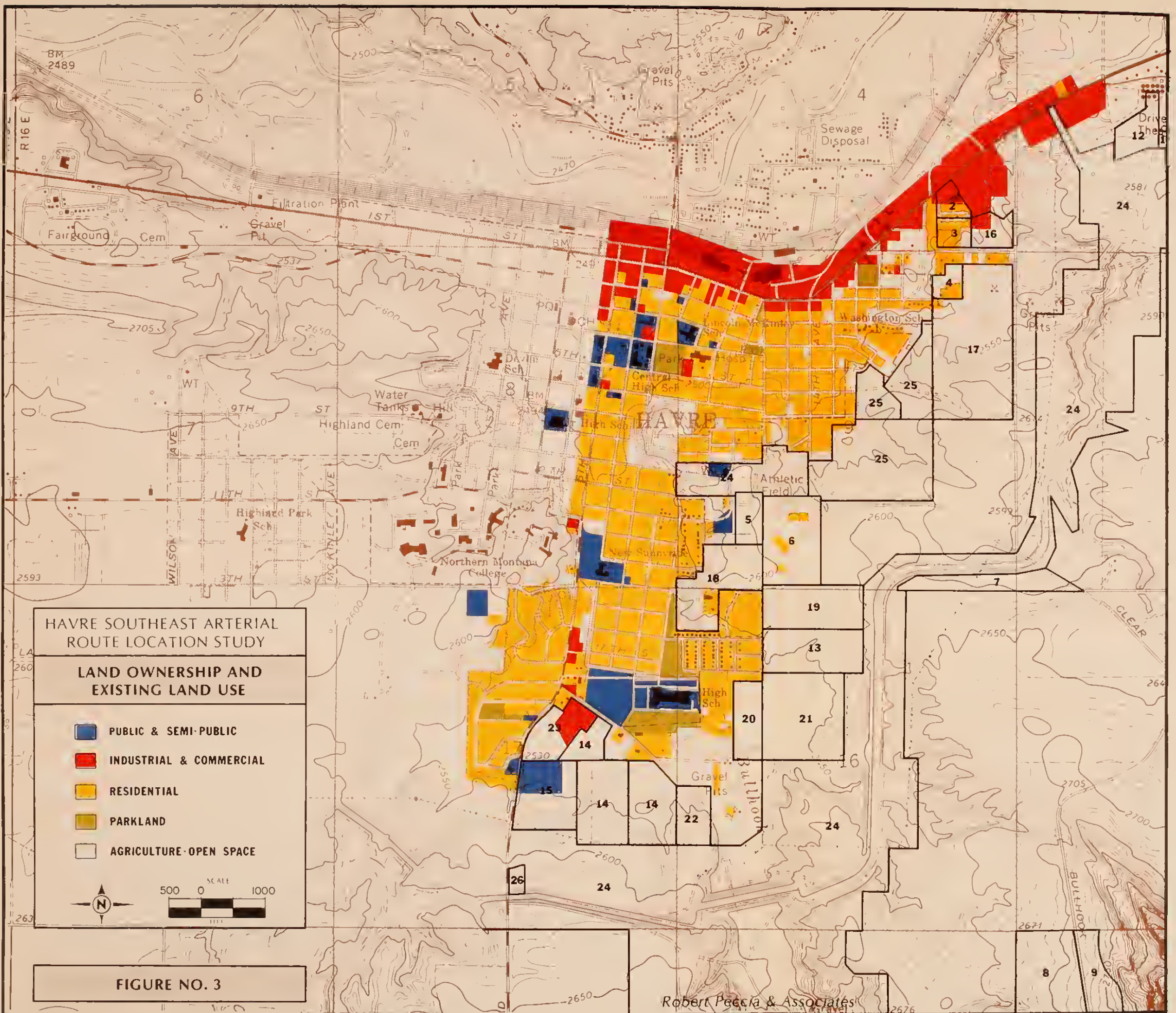


TABLE 1
LAND OWNERSHIP AND ANTICIPATED DEVELOPMENT

Tract No.	Development	Size (Acres)	Projected Growth (No. Units)
1	Losch No. 1 Subdivision	2.4	12
2	Hacienda Trailer Park	5.0	40
3	Low Rent Housing	5.5	60
4	Condominium Complex	6.0	43
5	Losch Addition No. 2	4.8	16
6	Glo-Ed Subdivision	30.0	76
7	Clear Creek Subdivision	6.5	5
8	Saddle Butte Estates No. 2	31.0	24
9	Upper Saddle Butte Estates	23.5	13
10	Saddle Butte Estates	60.4	7
11	Baltrusch Commercial Park	63.6	63.6
12	Sundown Mobile Home Park	12.6	77
13	Havre School District	25.0	1,000 students
14	Rolling Hills Subdivision	46.0	121
15	Lutheran Good Shepherd Nursing Home	22.7	150 beds
16	Undeveloped Land	7.5	60
17	Undeveloped Land	65.0	283
18	Undeveloped Land	25.9	105
19	Undeveloped Land	24.3	87
20	Undeveloped Land	12.3	53
21	Undeveloped Land	40.0	172
22	Undeveloped Land	10.5	45
23	Undeveloped Land	15.1	45
24	City Property	—	—
25	County Property	—	—
26	U.S. Border Patrol Station	3.4	—

CHAPTER III

Development of Alternatives

- A. CORRIDOR RESTRICTIONS
- B. REVIEWS WITH LOCAL AGENCIES
- C. ESTABLISHMENT OF ALTERNATIVES
- D. PUBLIC MEETING



CHAPTER III

DEVELOPMENT OF ALTERNATIVES

A. CORRIDOR RESTRICTIONS

The corridor established for this route location study is bounded by the City of Havre on the north and west and the Corps of Engineers canal on the south and east. Within this corridor there are limited possibilities on where to construct a southeast arterial route, and to which streets the arterial route should be connected.

The route location possibilities are to: 1) locate the route as near as possible to the City of Havre; 2) locate the route adjacent to the diversion canal; and 3) locate the route somewhere in between the City and the canal.

Access connection possibilities on each of the arterial routes include a connection to Beaver Creek Road between the intersection of Bull Hook Road and Fifth Avenue and the diversion canal on the west end of the route, and Twelfth Avenue, Fourteenth Avenue and Roller Coaster Road on the north end of the route. Intermediate access considerations were given to Bull Hook Road, Cedar Creek Road, Sixteenth, Fourteenth, Thirteenth, Eleventh and Tenth Streets.

B. REVIEWS WITH LOCAL AGENCIES

On the basis of these restrictions, several alternates were prepared showing a combination of the possibilities that were available under the restricted corridor. These options were displayed on maps of the corridor for presentation to local agencies.

Reviews were conducted with the City of Havre, the Hill County Commissioners, and the Havre-Hill City-County Planning Board. Comments from these agencies were incorporated into the alternatives proposed.

C. ESTABLISHMENT OF ALTERNATIVES

Based on the comments from the local agencies, three distinctive alternatives emerged. These alternates are shown on Figures 4, 5 and 6.

Alternative No. 1 is the alternate that lies closest to the City of Havre. This alternate is an extension of Fourteenth Avenue to the south with an east leg connecting to Beaver Creek Road just south of the Lutheran Nursing Home. Access connections are to Bull Hook Road, Sixteenth Street, Tenth Street and Cedar Creek Road.

Alternative No. 2 also consists of an extension of Fourteenth Avenue with an east leg connection to Beaver Creek Road just south of the Border Patrol. This alternate also has an additional leg along Roller Coaster Road from U.S. 2 to Cedar Creek Road, then extending west to an intersection with Fourteenth Avenue. Access connections include a tie to Thirteenth Street, Sixteenth Street and Bull Hook Road.

Alternative No. 3 follows the Corps of Engineers diversion canal as closely as possible from a intersection with Beaver Creek Road south of the Border Patrol to Cedar Creek Road, then extends northerly along Roller Coaster Road. Access connections are made to Sixteenth Street, Tenth Street and Clear Creek Road.

D. PUBLIC MEETING

The three alternatives for the Havre Southeast Arterial Route were presented in a public meeting in Havre to determine if these alternatives included the most feasible for the arterial route. A summary manuscript of the meeting is included in Appendix "A" of this report.

Included in those people attending the meeting were Steve Kologi and Hazen Flickenger of the Department of Highways; Norris Hyatt, Mayor; Dan Morse, Chairman of the County Commissioners; and Dave Johnston, Director of the Chamber of Commerce. A majority of the land-owners affected were also present.

The Consultant explained the scope of the project and the three alternates proposed, and the meeting was then opened for questions. Some pertinent points that were brought out included the following:

The wisdom of only planning for half of an arterial system was questioned, and some people felt the study should be extended to include the southwestern area of Havre also.

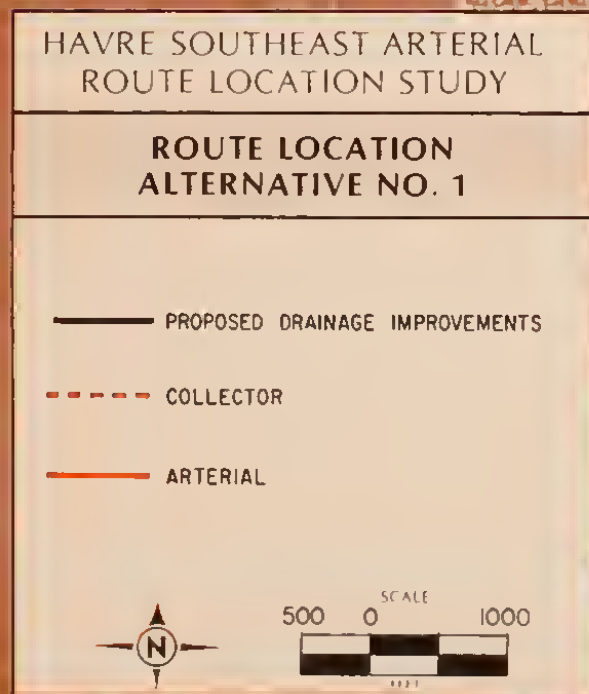
The School Board did not want the road anywhere on their property.

The Lutheran Home did not want the road anywhere on their property.

The City felt the purpose of the road was to relieve traffic on Fifth Avenue and to serve more as an urban arterial, while the County felt the road was primarily for bypass traffic. Both appeared to be agreeable to some sort of compromise.

Mr. Kologi discussed the funding and time frame for the project depending upon the importance of the project to the community.

In summary, the three alternates that were presented appeared to offer the best choices for an arterial route. Therefore, the three alternatives that were developed were chosen for analysis.



2.2 Miles of Arterial
0.5 Miles of Collector

FIGURE NO. 4

HAVRE SOUTHEAST ARTERIAL
ROUTE LOCATION STUDY

ROUTE LOCATION
ALTERNATIVE NO. 2

- PROPOSED DRAINAGE IMPROVEMENTS
- - - COLLECTOR
- ARTERIAL

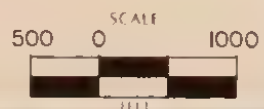


FIGURE NO. 5



4.0 Miles of Arterial
0.7 Miles of Collector

HAVRE SOUTHEAST ARTERIAL
ROUTE LOCATION STUDY

ROUTE LOCATION
ALTERNATIVE NO. 3

— PROPOSED DRAINAGE IMPROVEMENTS

- - - COLLECTOR

— ARTERIAL

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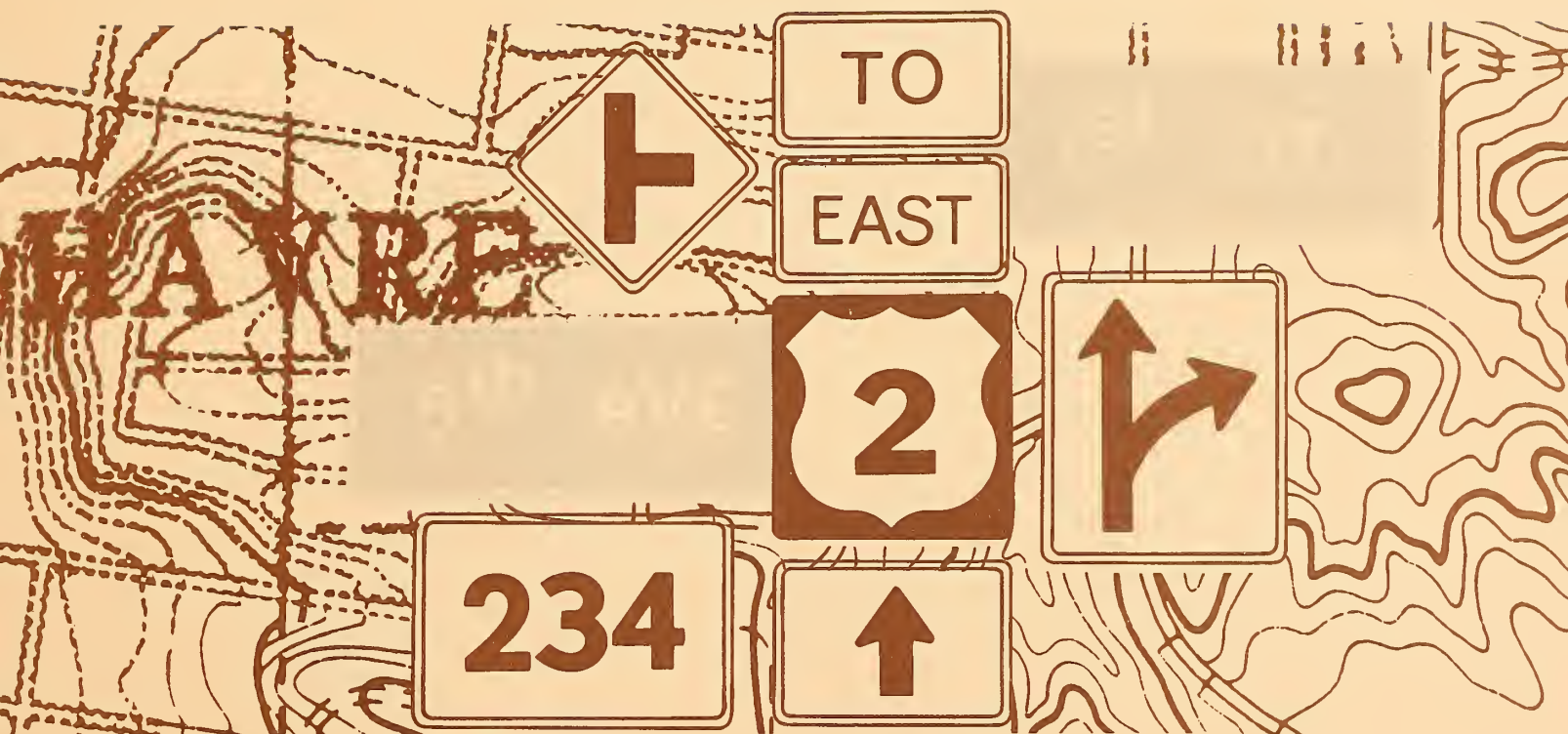
FIGURE NO. 6



CHAPTER IV

Traffic Studies and Assignments

- A. EXISTING TRAFFIC COUNTS
- B. TURNING MOVEMENT AND SPECIAL COUNTS
- C. TIME AND DELAY STUDY
- D. ASSIGNMENT OF EXISTING TRAFFIC
- E. ANTICIPATED DEVELOPMENT
- F. FUTURE TRAFFIC GENERATION
- G. ASSIGNMENT OF FUTURE TRAFFIC
- H. DESIGN TRAFFIC VOLUMES
- I. CAPACITY ANALYSIS



CHAPTER IV

TRAFFIC STUDIES AND ASSIGNMENTS

A. EXISTING TRAFFIC COUNTS

(1) Permanent Traffic Counter

A permanent traffic counter and recorder is located on the west end of Havre near the Department of Highways building. This permanent counter is owned and operated by the Montana Department of Highways and provides a continuous record of traffic flow at this location. From this continuous recorder information on traffic variations, historical traffic growth and traffic characteristics can be obtained.

Historical traffic volumes in annual average daily traffic are shown in Figure 7 for the period 1961 to 1979. As can be noted by examining the figure, traffic has more than doubled during this eighteen-year period. It is also noted that energy shortages occurring in 1974 and at the present time have resulted in traffic decreases for these periods.

Monthly variations in traffic flow can also be established and examined from the information available from the permanent traffic counter. Monthly variations are useful in determining seasonal fluctuations in traffic and in establishing factors for calculating annual average traffic volumes from machine counts. Figure 8 shows monthly variations in traffic for the Havre permanent traffic counters. The years 1975, 1978 and 1979 were chosen for comparison since construction was occurring on U.S. 2 in 1976 and 1977 and the counts were not representative of average conditions. It is noted that sharp increases in traffic volumes occur during the summer months with traffic flow in July and August being periods of peak traffic flow. Low traffic flows occur in January and February.

Hourly volume variations in traffic are shown in Figure 9.

(2) Machine Counts

The Montana Department of Highways also conducts periodic machine counts in Havre. The most recent counts were taken during the first week of October, 1979. During this period, two-day machine counts were taken at 53 count locations throughout Havre. These machine traffic count locations are shown in Figure 10, and the available counts for these locations for 1979 are shown in Table 2.

B. INTERSECTION TURNING MOVEMENTS AND SPECIAL COUNTS

(1) Intersection Counting Procedures

Manual turning movement counts were made at eleven intersections along Fifth Avenue, four intersections along U.S. 2 and one at the intersection of Fourteenth and Sixth Avenues. Of

ANNUAL AVERAGE DAILY TRAFFIC VOLUMES

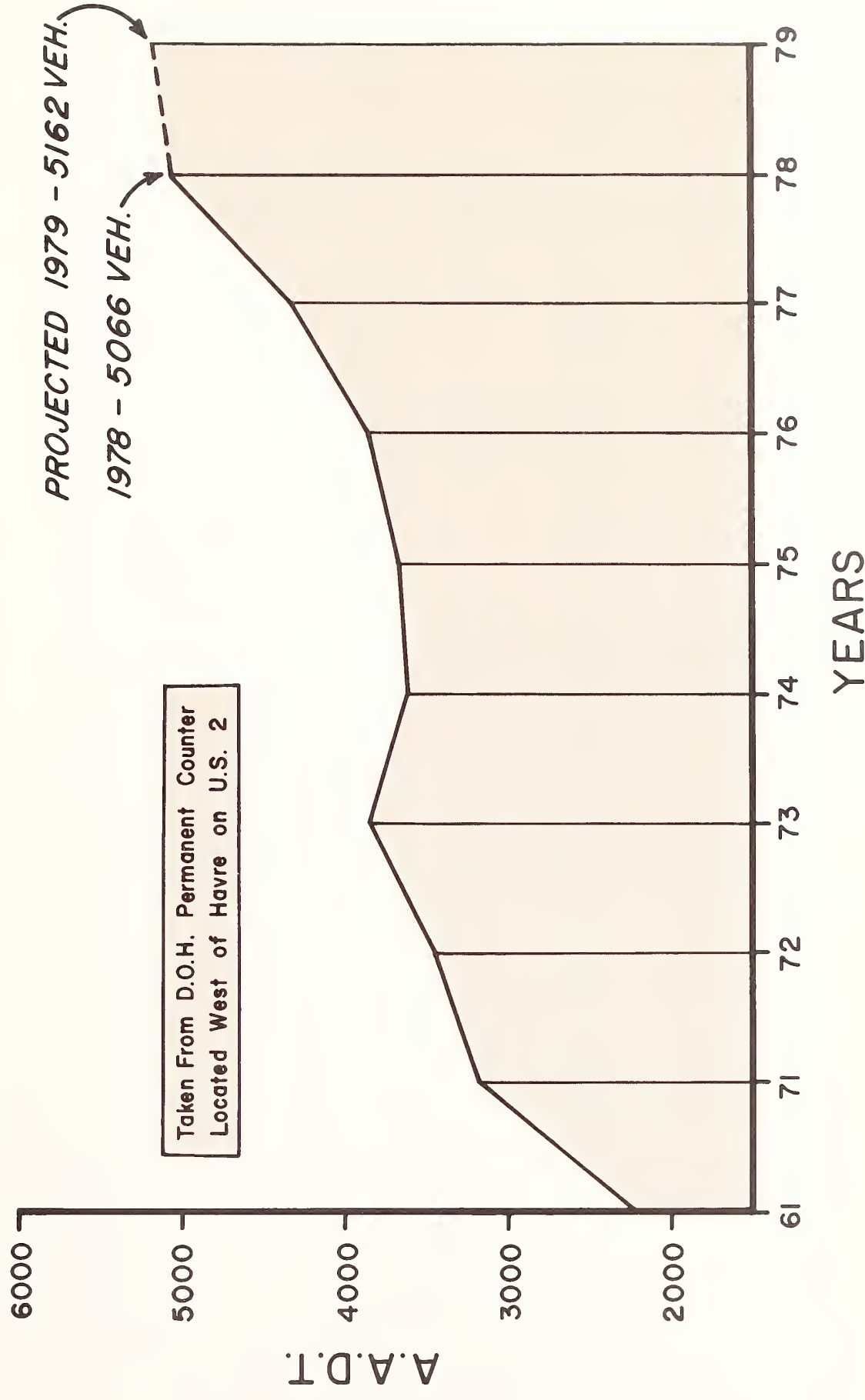


FIGURE NO. 7

MONTHLY VARIATIONS IN AVERAGE DAILY TRAFFIC

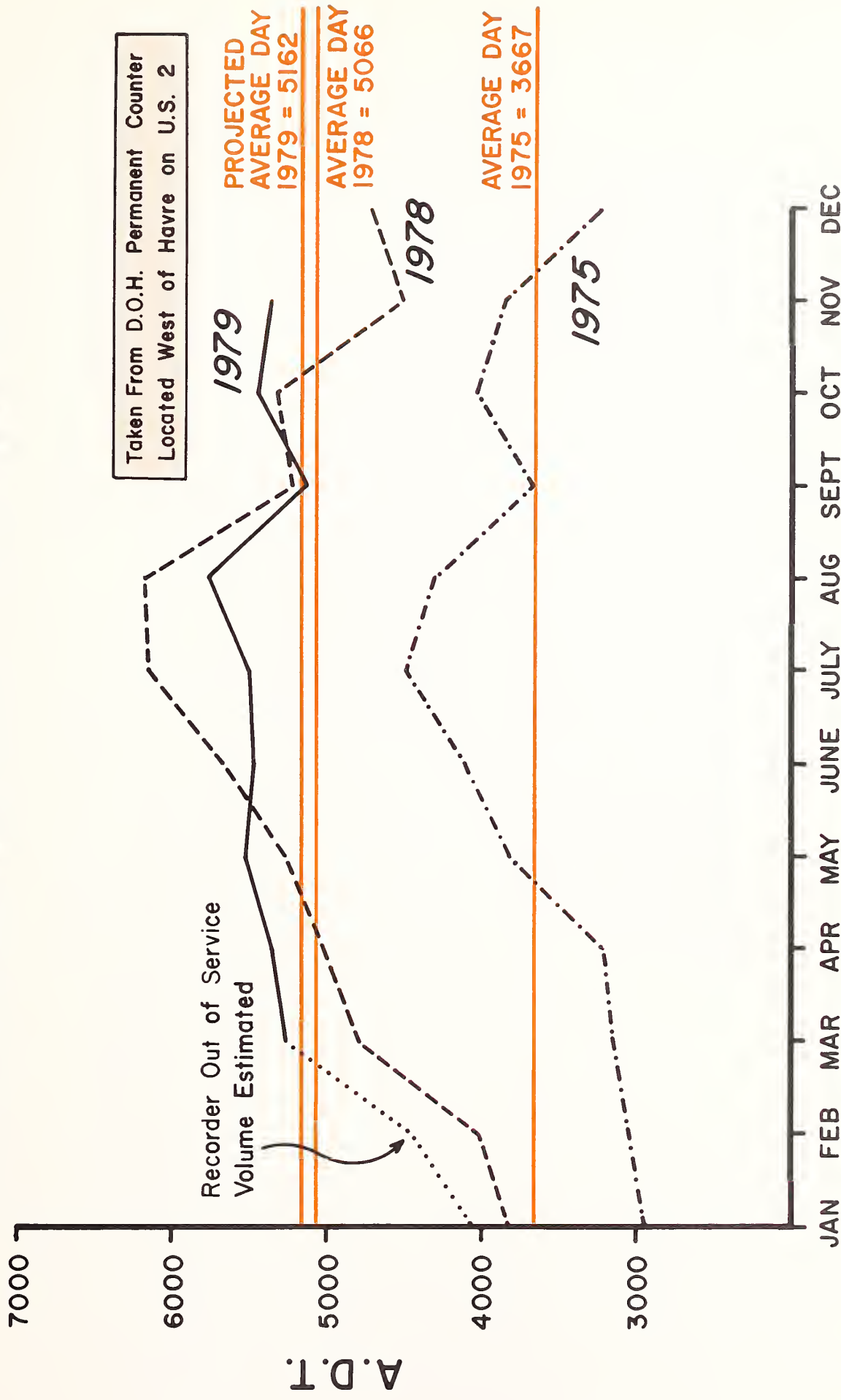


FIGURE NO. 8

HOURLY VOLUME VARIATIONS IN TRAFFIC

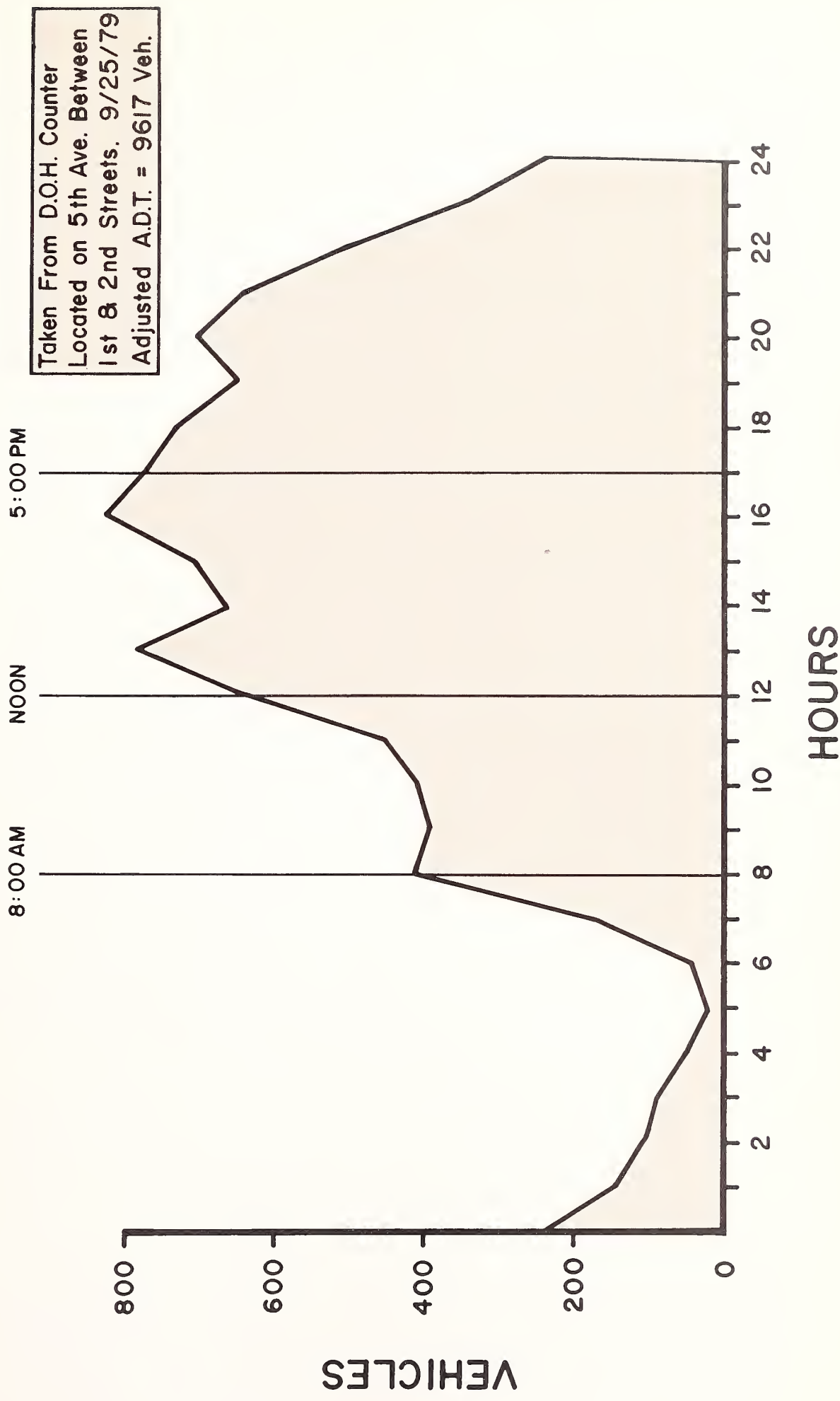


FIGURE NO. 9

TABLE 2
ANNUAL AVERAGE DAILY TRAFFIC

Station No.	1979 AADT	Station No.	1979 AADT
1	Out of Study Area	31	2,633
2	Out of Study Area	32	1,225
3	No Count	33	1,418
4	No Count	34	1,849
5	No Count	35	581
6	6,149	36	377
7	8,153	37	2,256
8	15,566	38	5,575
9	15,667	39	4,117
10	13,728	40	3,737
11	11,121	41	7,952
12	10,404	42	5,827
13	7,979	43	2,583
14	3,900	44	8,673
15	Out of Study Area	45	10,145
16	Out of Study Area	46	11,918
17	Out of Study Area	47	12,491
18	693	48	9,617
19	772	49	1,005
20	269	50	No Count
21	148	51	1,403
22	2,290	52	5,355
23	4,980	53	3,493
24	3,452	54	1,844
25	1,307	55	509
26	1,661	56	1,285
27	4,062	57	1,444
28	3,099	58	Out of Study Area
29	2,472	59	No Count
30	3,513	60	Out of Study Area

Traffic counts performed by Montana Department of Highways.

these sixteen counts, five were done by the Department of Highways in January of 1979. These counts were made on Tuesday, Wednesday or Thursday during the week to achieve average week-day counts.

These manual counts were taken using traffic counter boards with volumes recorded for each fifteen-minute increment for a minimum of two hours during a peak traffic volume period. The maximum peak period occurred in the afternoon, most often between 4:45 p.m. and 5:45 p.m. However, the peak period at the intersection of Fifth Avenue and Bull Hook Road and Fifth Avenue and Seventeenth Street occurred between 3:00 p.m. and 4:00 p.m. in the afternoon, probably reflecting the influence of the traffic from the high school. Detailed information on the turning movements is contained in a calculation report on file with the Department of Highways Consultant Design Section.

The purpose of the manual turning movement counts was to identify traffic flow patterns so that an assignment of existing traffic to a theoretical major street network could be made.

(2) Special Traffic Studies

In addition to the intersection turning movement counts, special traffic composition counts were made on Clear Creek Road at the diversion canal and Beaver Creek Road at the diversion canal. These counts were done to identify the types of vehicles using these roads, and to assess the probable use of the bypass by commercial and farm vehicles. These counts were taken during the month of November and would not be representative of the commercial and farm traffic during the peak of the harvest season. The figures do, however, give an indication of the magnitude and importance of the commercial and farm vehicle traffic.

A summary of the counts taken is shown in Table 3. It should be noted that these were 12-hour counts taken from 6:00 a.m. to 6:00 p.m. and were not adjusted to a 24-hour period since the purpose of the counts was traffic composition and not volume.

TABLE 3

TRAFFIC COMPOSITION COUNTS

	Total Vehicles	Cars		Pickups		Farm & Commercial	
		No.	%	No.	%	No.	%
Beaver Creek at Diversion Canal	676	427	63.2%	192	28.4%	57	8.4%
Clear Creek Road at Diversion Canal	479	275	57.4%	167	34.9%	37	7.7%

As can be noted from the table, farm and commercial vehicles comprised less than 10 percent of the traffic during the period the traffic was counted. The specific type of vehicle counted was recorded and the information is on file at the Montana Department of Highways Consultant Design Section.

C. TRAVEL TIME AND DELAY STUDY

A travel time and delay study was made to determine average travel times and speeds, and intersection delays. Eight runs (four in each direction) were made during the peak traffic period from the Lutheran Home north along Fifth Street to U.S. 2, then east along U.S. 2 to the intersection with Roller Coaster Road. Travel times and intersection delays were recorded and average travel speeds calculated. It was determined that during the peak hour it took an average of 6.86 minutes to travel the distance of 3.13 miles for an average speed of 27.4 miles per hour.

D. ASSIGNMENTS OF EXISTING TRAFFIC

Using the turning movement counts to establish traffic flow patterns, procedures were developed to assign existing traffic to each of the three alternatives if they existed at the present time. These procedures utilized least travel time theory similar to procedures used to assign traffic in a computer gravity model. Travel times and intersection delays on the proposed alternatives were estimated for each section of road based on the expected characteristics of the roadway section.

Existing traffic was assigned to each proposed alternative by examining traffic patterns and turning movements at each intersection and rerouting traffic according to the least travel time theory. The rerouted existing traffic for each intersection on all three alternates is contained on displays on file at the Montana Department of Highways Consultant Design Section.

E. LAND OWNERSHIP AND ANTICIPATED DEVELOPMENT

Within the study corridor there are a number of parcels with different ownerships. It was considered important to the location study to identify the ownership of the various parcels and to identify potential development that might occur in the area. The expected development is based on the best information available at the time this report was compiled, but caution should be used in interpreting the results since development plans may change in the future.

This land ownership and anticipated development is pertinent from the standpoint of establishing routes that would have minimum disruptive effect on existing parcels and, to the extent possible, compatibility with proposed developments. Table 4 and Figure 3 show the anticipated development.

F. FUTURE TRAFFIC GENERATION

The anticipated development occurring in the study corridor was used to estimate future trips that would be generated, and the increased traffic that would result. Trip generation rates from the *Trip Generation Manual* issued by the Institute of Transportation Engineers were used to estimate the trips that would be generated by each type of development. Table 4 shows the trips that would be generated by future development.

G. ASSIGNMENT OF FUTURE TRAFFIC

The trips that would be generated by future development were then manually assigned to each alternative and the existing street network if no arterial were to be constructed. Again, the procedure used for this assignment was the least travel time method similar to a gravity model.

The traffic generated due to the future development is shown on displays on file at the Montana Department of Highways Consultant Design Section.

Due to the uncertainty in the energy situation and the levelling off of traffic growth, outside factors including development in other parts of Havre that would influence traffic growth were felt to be negligible in comparison to the traffic generated by the anticipated development. This external traffic growth was therefore not included in establishing future traffic volumes.

H. DESIGN TRAFFIC VOLUMES

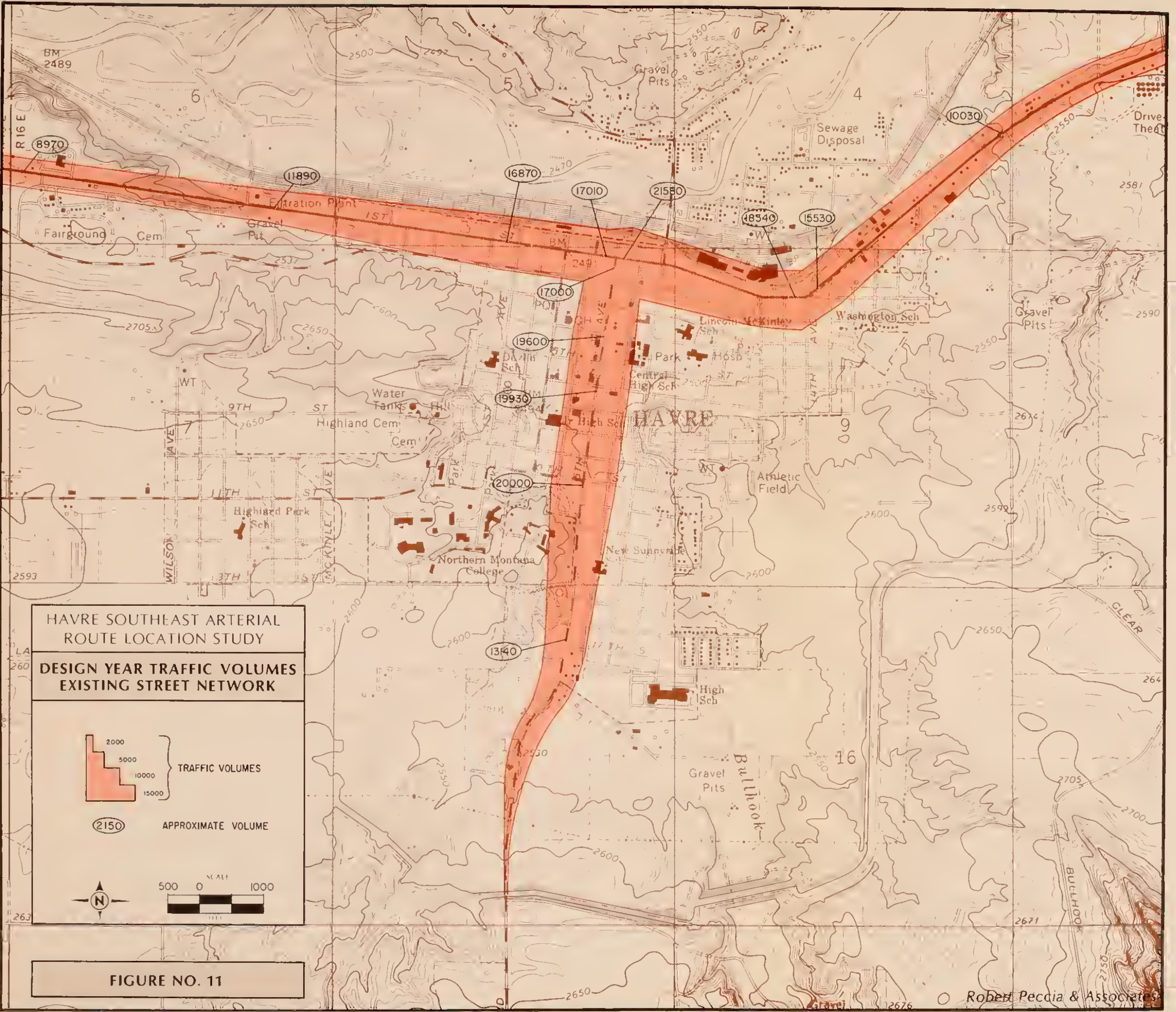
The existing traffic volumes computed with the future traffic generated by anticipated development provide the traffic volumes for the design year. Since the anticipated development is expected to occur by the year 2000, this was considered a reasonable design year that is also compatible with the twenty-year design period normally used for projects of this type.

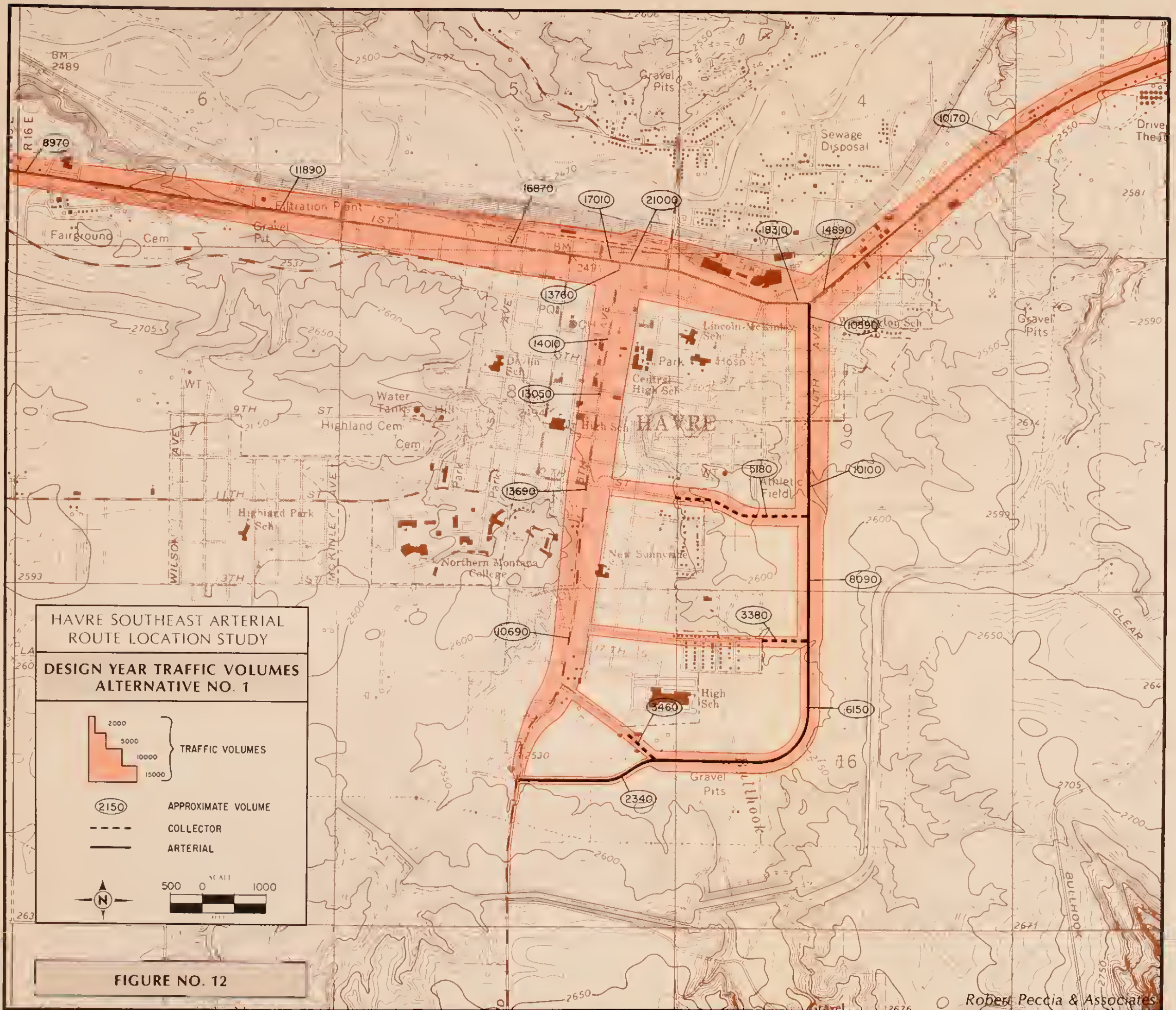
Figures 11, 12, 13 and 14 show the design year traffic for the existing street network with no arterial and for each alternative under consideration.

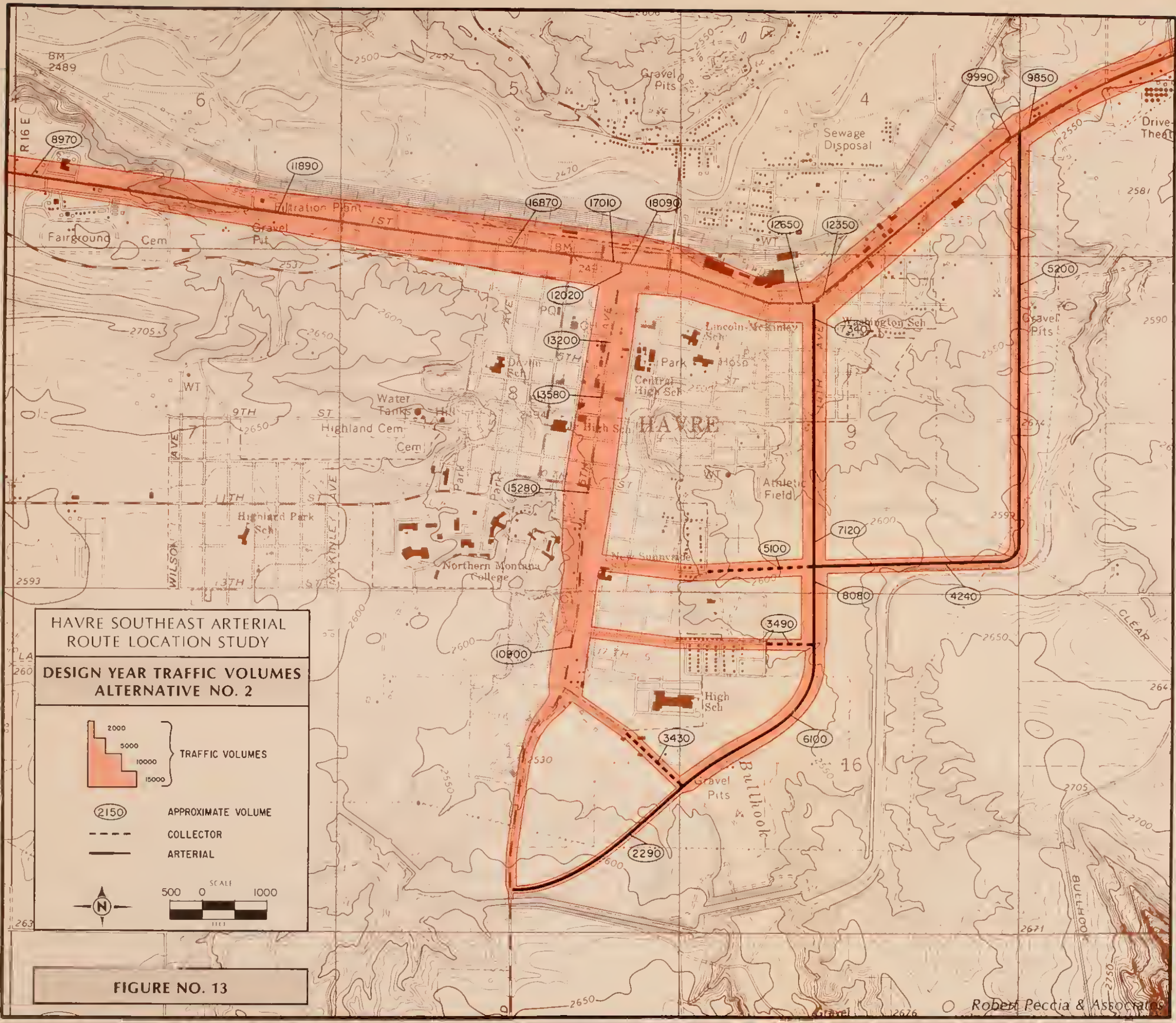
I. CAPACITY ANALYSIS

Capacity calculations were conducted at the signalized intersections of Fifth Avenue and Fourteenth Street, Fifth Avenue and Tenth Street, U.S. 2 and Fifth Avenue, and U.S. 2 and Fourteenth Avenue. These are the intersections at which the heaviest traffic volumes occur, and where traffic capacity problems would be most likely to exist.

The capacity of a particular street is restricted by intersection conditions, and is a function of the intersection approach width, traffic characteristics, metropolitan area size, signal time, and physical characteristics of the intersection. It is noted that capacity calculations are theoretical and according to the *Transportation and Traffic Engineering Handbook*, the methods . . . "are adequate for gross examination but seldom provide the knowledgeable user with a complete sense of ease when a precise answer is required." Interpretation of the results should, therefore, be viewed with caution.







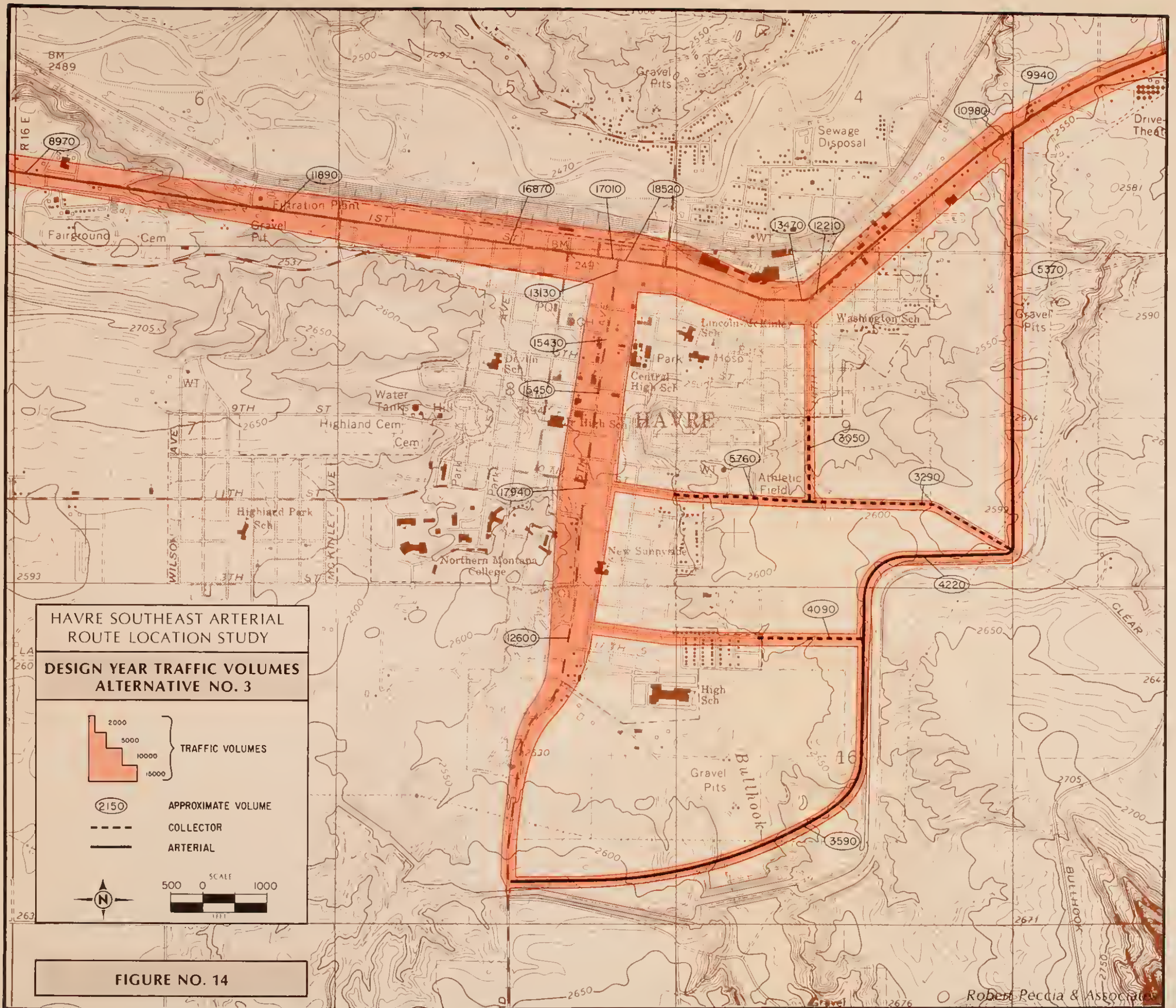


TABLE 4
TRIPS GENERATED BY FUTURE DEVELOPMENT

Tract No.	Development	Size (Acres)	Projected Growth (No. Units)	Trip Generation Rate	Trips Generated
1	Losch No. 1 Subdivision	2.4	12	10.0/unit	120
2	Hacienda Trailer Park	5.0	40	5.4/unit	216
3	Low Rent Housing	5.5	60	6.1/unit	366
4	Condominium Complex	6.0	43	5.1/unit	219
5	Losch Addition No. 2	4.8	16	10.0/unit	160
6	Glo-Ed Subdivision	30.0	76	9.6/unit	730
7	Clear Creek Subdivision	6.5	5	10.0/unit	50
8	Saddle Butte Estates No. 2	31.0	24	10.0/unit	240
9	Upper Saddle Butte Estates	23.5	13	10.0/unit	130
10	Saddle Butte Estates	60.4	7	10.0/unit	70
11	Baltrusch Commercial Park	63.6	63.6	56.1/acre	3,568
12	Sundown Mobile Home Park	12.6	77	5.4/unit	415.8
13	Havre School District	25.0	1,000 students	1.02/stdnt.	1,020
14	Rolling Hills Subdivision	46.0	121	10.0/unit	1,210
15	Lutheran Good Shepherd Nursing Home	22.7	150 beds	2.7/bed	405
16	Undeveloped Land	7.5	60	6.1/unit	366
17	Undeveloped Land	65.0	283	10.0/unit	2,830
18	Undeveloped Land	25.9	105	7.8/unit	819
19	Undeveloped Land	24.3	87	10.0/unit	870
20	Undeveloped Land	12.3	53	10.0/unit	530
21	Undeveloped Land	40.0	172	10.0/unit	1,720
22	Undeveloped Land	10.5	45	10.0/unit	450
23	Undeveloped Land	15.1	45	10.0/unit	450
24	City Property	—	—	—	—
25	County Property	—	—	—	—
26	U.S. Border Patrol Station	—	—	—	—

According to the capacity calculations, traffic on both U.S. 2 and Fifth Avenue is operating at acceptable levels of service (Service Level "C" or higher) for present-day traffic. For the year 2000, projected traffic volumes at the intersection of Fifth Avenue and U.S. 2 will be at or near capacity if none of the proposed alternatives are constructed. With any of the proposed alternatives, none of the intersections would be at capacity. However, preliminary investigations on volume warrants for traffic signals indicate that a traffic signal would likely be required at the intersection of Fourteenth Avenue and U.S. 2 for Alternates No. 1 and 2.

Although the capacity calculations do not indicate that Fifth Avenue and U.S. 2 are operating near capacity, a problem in traffic flow does exist. At current volumes it is difficult to access on Fifth Avenue at other than signalized intersections. Minor inconveniences in travel delays and circulation problems do exist, and although not necessarily a capacity problem, the volumes do constitute a restraint on traffic flow. Keeping in mind that the capacity calculations are intended for more urbanized areas, the existing traffic volumes may be approaching the desirable limit for a city such as Havre, particularly with projected traffic volumes. This is confirmed with the concern Havre residents have expressed with traffic on Fifth Avenue.

The construction of Alternatives No. 1 and 2 will reduce the traffic volumes on Fifth Avenue to acceptable limits through the year 2000 with Alternative No. 3 having significantly less impact on the Fifth Avenue traffic volume.

CHAPTER V

Drainage and Utilities

- A. DRAINAGE
- B. UTILITIES



CHAPTER V

DRAINAGE AND UTILITIES

A. DRAINAGE

In July of 1979, the Havre-Hill City-County Planning Board had an Urban Drainage Plan prepared for the Havre area by the firm of Robert Peccia and Associates. This plan contains an analysis of existing storm drain facilities, identification of deficiencies and problem areas, delineation of drainage basins, estimates of storm runoff for minor storms, and recommendations for drainage improvements. This drainage plan was used to establish the drainage provisions that would be required for the bypass route alternatives.

The recommended drainage improvements that would be required for the Havre bypass, depending on the alternative chosen, are as follows:

12 blocks of storm drains with inlets and manholes for drainage improvements to Fourteenth Avenue. This includes five blocks of storm drain along Fourteenth Avenue and seven blocks along Second Street.

A 48" x 36" concrete box culvert under the bypass for the Bull Hook drainage.

Twin 72" x 60" concrete box culverts for the diversion canal discharge along Roller Coaster Road. This could be comparable to the drainage structure under U.S. 2.

Various culverts along the bypass route to handle local drainages. These pipes would all be 24" or larger for ease of maintenance.

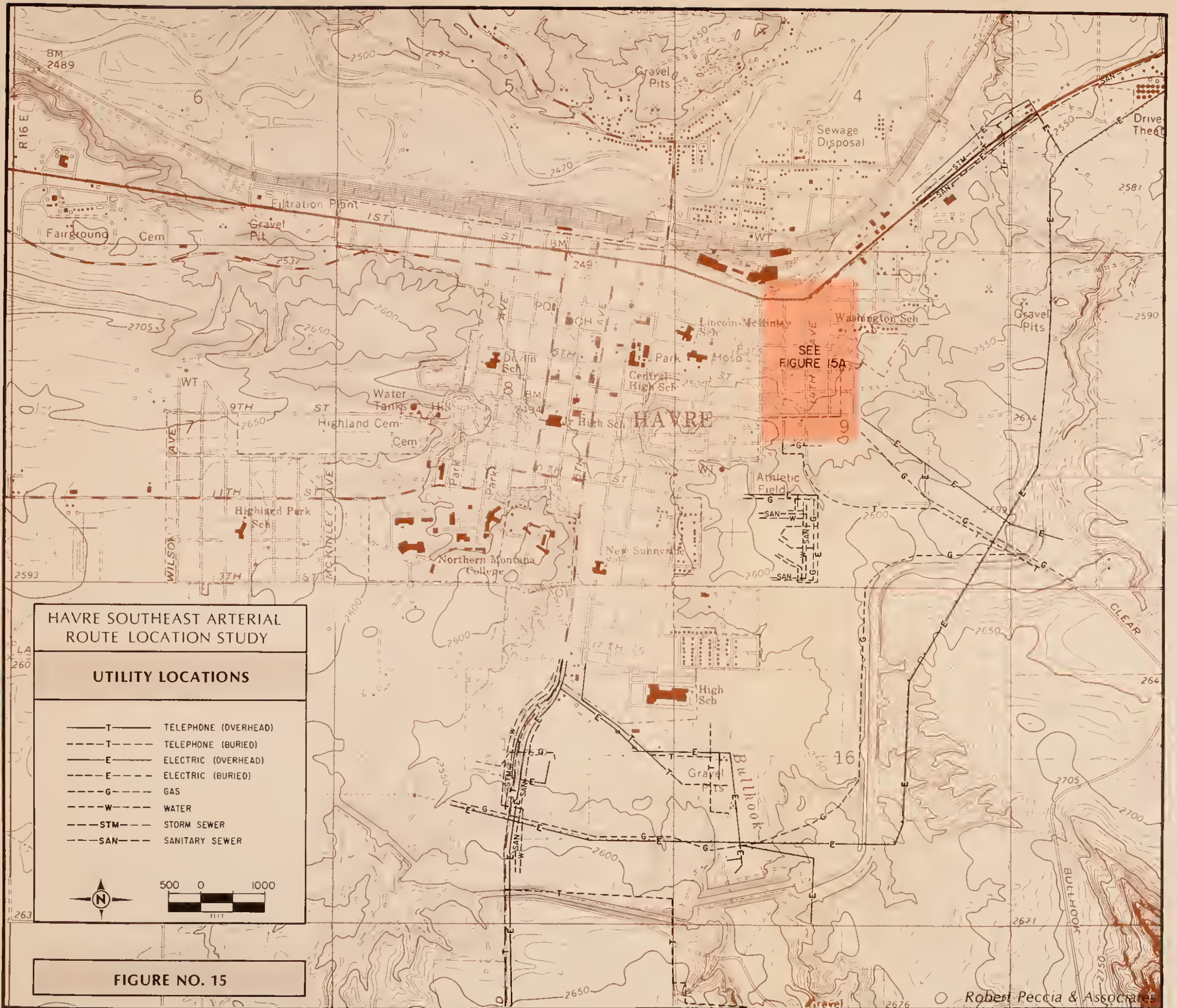
Retention/detention basins in combinations that would be appropriate for the alternate chosen for construction. These are included on a non-specific basis for this location study report, and specific layouts and locations will be included as part of the preliminary design of the selected route.

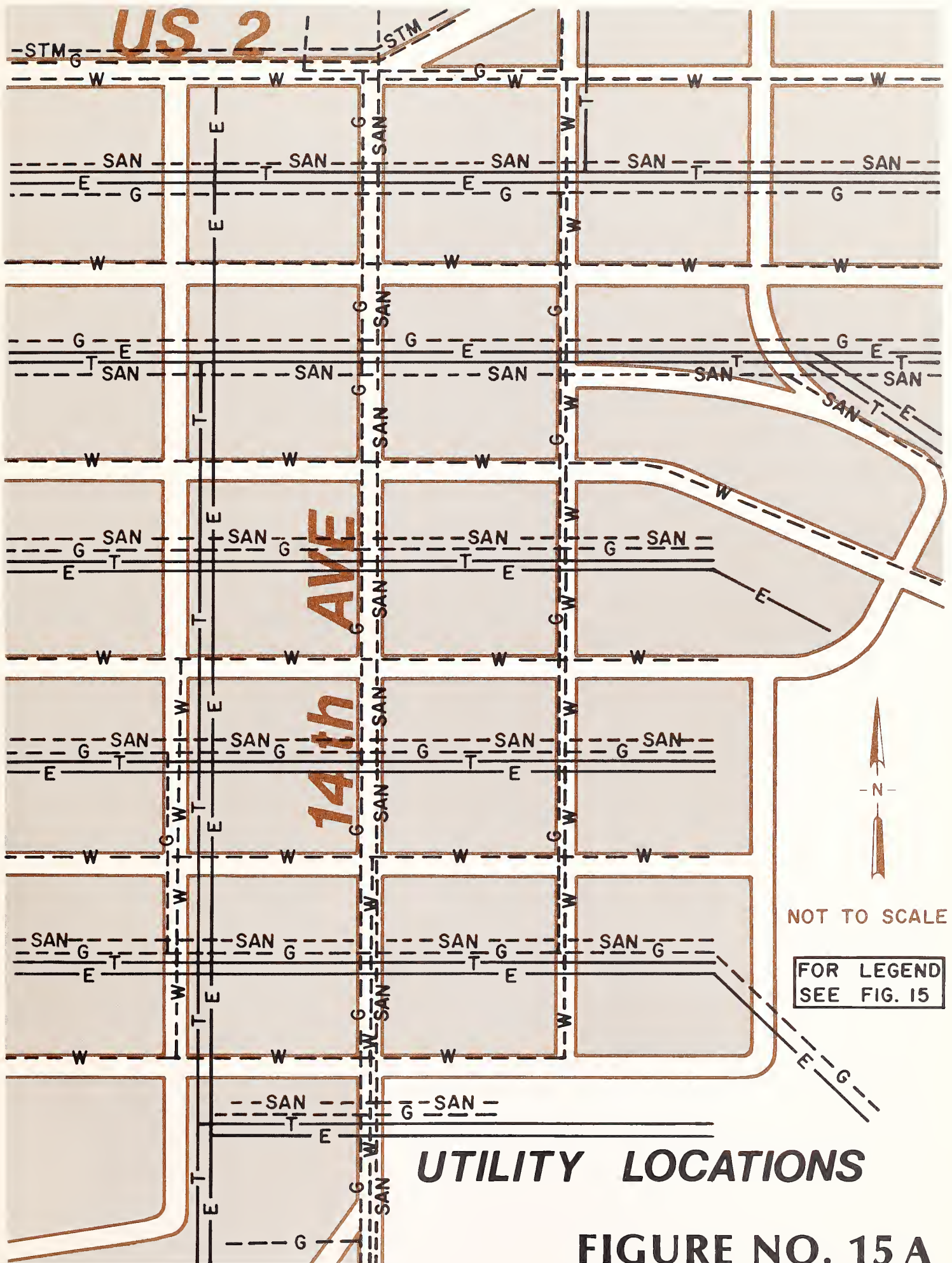
The drainage improvements that would be applicable for each alternate are shown on Figures 4, 5 and 6 which are the three route locations under consideration.

B. UTILITIES

Utilities in the study corridor consist of underground and overhead electrical lines, underground and overhead telephone, underground gas, storm drain, sanitary sewer and water lines. These utilities are affected in various degrees by the three alternatives. The specific impacts on these utilities will be addressed at the time a final alternative is selected.

Figures 15 and 15a show the location of these utilities in the study corridor.





CHAPTER VI

Construction Cost Estimates

- A. UNIT PRICES
- B. QUANTITIES
- C. CONSTRUCTION COST ESTIMATES



CHAPTER VI

CONSTRUCTION COST ESTIMATES

A. UNIT PRICES

Unit prices for the construction cost estimates were obtained from recent highway projects in and near Havre and current bid tabulations from the Montana Department of Highways for the period of January through June, 1979. Specific projects that were used to obtain unit prices include the reconstruction of U.S. 2 in Havre, bid May, 1977, improvements to Thirteenth Street, bid May, 1979, and Chinook Storm Drain and Water System Improvements, bid August, 1979. The unit bid prices used for these project are contained in Appendix "B". These prices are considered to be representative of 1979 prices for the Havre area.

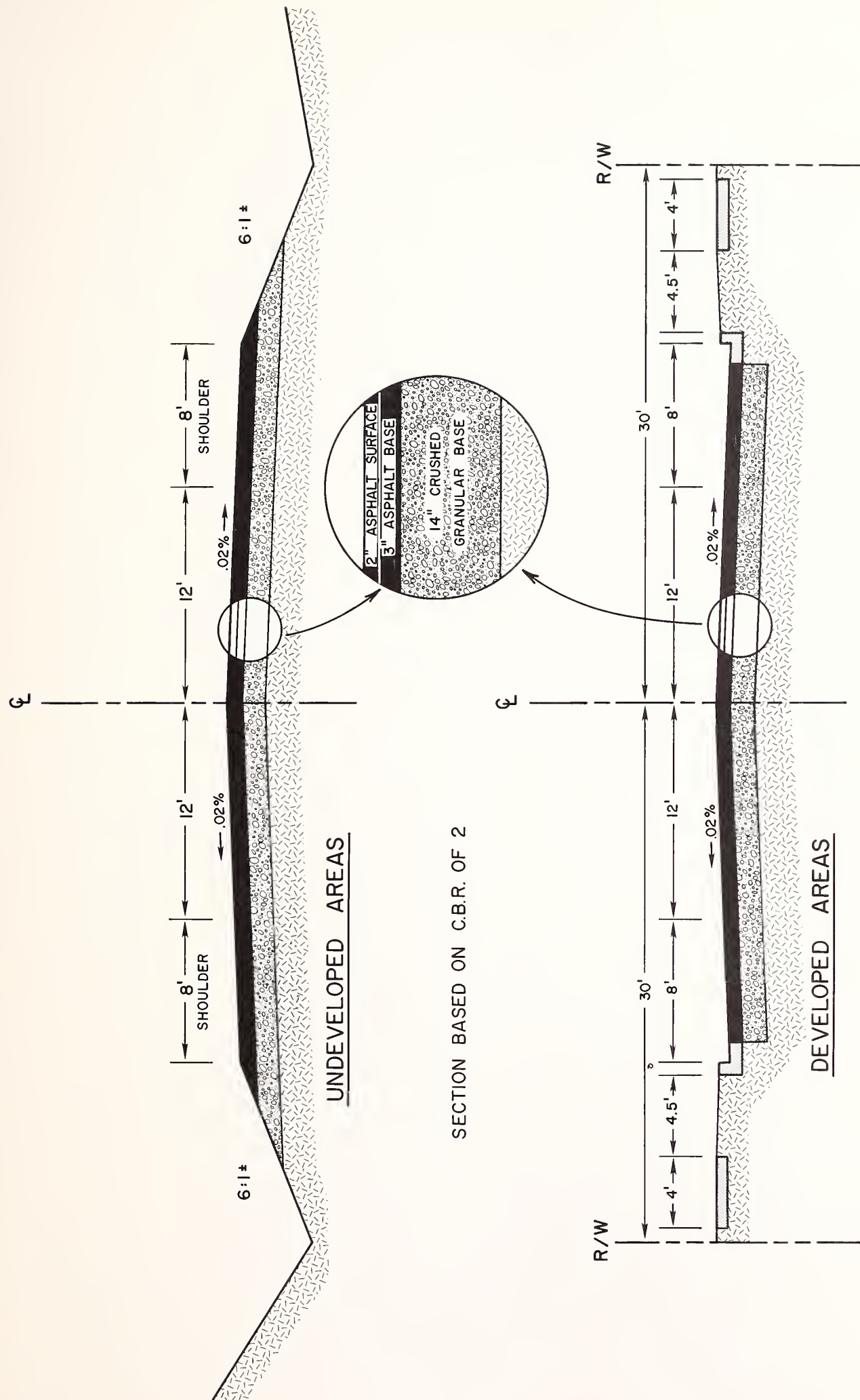
B. QUANTITIES

Material quantities for the project were obtained from the typical section shown on Figure 16. This typical section was based on a soil support value obtained from Northern Testing Laboratories for the Havre area and a preliminary pavement design done according to the *Thickness Design Manual for Asphalt Pavements* issued by the Asphalt Institute. The design was based on average traffic for a twenty-year design period with five percent trucks. Base and surfacing quantities for each alternative were computed from the length of the alternatives and the typical section. Earthwork quantities were based on average excavation and embankment quantities for the type of terrain encountered. Drainage improvements were previously identified in Chapter V - Drainage and Utilities.

C. CONSTRUCTION COST ESTIMATES

Using the unit prices combined with the computed quantities, the estimated construction cost for each alternative was calculated. Ten percent was added to the base cost to include miscellaneous items not specifically identified, and twenty percent was added to cover administration, legal, engineering and contingencies. The final construction cost estimates are contained in tables in Appendix "B". These costs are considered to be representative of 1979 construction costs for Havre.

These costs do not include any land acquisition costs, since it is expected that most of the rights-of-way will be obtained through the subdivision process.



HAVRE SOUTHEAST ARTERIAL
ROUTE LOCATION STUDY
TYPICAL SECTION

FIGURE NO. 16

CHAPTER VII

Benefit - Cost Analysis

- A. COSTS
- B. BENEFITS
- C. BENEFIT – COST RATIOS



CHAPTER VII
BENEFIT - COST ANALYSIS

A. COSTS

(1) Annual Capital Costs

Annual capital costs were computed for each alternative using the construction cost estimate, a service life of 20 years, and an interest rate of 10 percent. The Capital Recovery Factor for these conditions is .1175. No costs for acquisition of right-of-way were included in these estimates, since it is hoped that nearly all of the required right-of-way will be obtained through the subdivision process over a period of time.

The annual capital cost for each alternative is as follows:

Alternative	Construction Cost Estimate	Annual Capital Cost
1	\$ 2,542,903	\$298,791
2	3,766,490	442,563
3	2,708,355	318,232

(2) Annual Maintenance Costs

Actual annual maintenance costs incurred during a three-year period for 5th Avenue were obtained from the Montana Department of Highways District Office in Havre. These costs were increased moderately to allow for some increased maintenance as the avenue increases in age during the project period. The annual maintenance cost for 5th Avenue was determined to be \$7500 per mile of roadway.

Annual maintenance costs for U.S. 2 were also obtained from the Montana Department of Highways. Since this highway was reconstructed in 1977 and 1978, the current condition of this highway is excellent and the maintenance costs correspondingly low. A historical maintenance cost average was used for U.S. 2 to account for this situation. The annual maintenance cost for U.S. 2 was estimated to be \$11,000 per mile of roadway.

An average per mile cost for secondary roads was obtained from the Montana Department of Highways. This cost was considered to be representative of the rural sections of the bypass route. The current figure for secondary road maintenance is \$2,354 per mile of road.

These maintenance costs were considered to be indicative of the maintenance costs that would occur on the bypass alternatives. Using these maintenance costs with the appropriate mileage of roadway of each type resulted in an annual maintenance cost for the three alternatives. These annual maintenance costs are shown in the following table:

Alternative	Urban Miles	Urban Roadway Maintenance Cost (\$7500/mi)	Rural Miles	Rural Roadway Maintenance Cost (\$2354/mi)	Total Maintenance Cost
1	2.190	\$16,425	—	—	\$16,425
2	2.216	16,620	1.847	\$4,348	20,968
3	—	—	3.324	7,825	7,825

(3) Total Annual Costs

Combining the annual capital costs with the annual maintenance costs results in a total annual cost. The annual costs for each alternative are as follows:

Alternative	Annual Capital Cost	Annual Maintenance Cost	Total Annual Cost
1	\$ 298,791	\$ 16,425	\$315,216
2	442,563	20,968	463,531
3	318,232	7,825	326,057

B. BENEFITS

(1) General

It was originally intended to use the Department of Highways standard benefit/cost methods and forms for this project. However, the nature of this project did not lend itself to the established procedures currently being used by the Department of Highways, and it was decided that actual benefits would have to be identified for the analysis to yield a valid result. The procedures and benefits that were used were established and reviewed with the Department of Highways prior to being implemented.

The procedures generally follow the recommendations contained in the *Road User Benefit Analyses for Highway Improvements* published by the American Association of State Highway Officials.

(2) Vehicle Operational Benefits

The construction of a bypass route will result in certain benefits to vehicle operation. In particular, benefits will be incurred due to travel distances and number of stops. In the case of the bypass, it was found that travel distances increased according to the traffic assignment model. This yields a negative benefit due to the increased travel distances.

Average vehicle operating costs were calculated from information obtained from the American Automobile Association and were found to be \$.209 per mile per vehicle. Increased travel was found to be 254,274 vehicle miles for Alternative No. 1; 416,228 vehicle miles for Alternative No. 2 and 423,327 vehicle miles for Alternative No. 3. These figures yield negative travel savings of \$53,143 for Alternative No. 1; \$86,992 for Alternative No. 2, and \$88,475 for Alternative No. 3.

The savings in stop time were estimated to be \$.037 per vehicle per stop. This figure was obtained from the *Road User Benefit Analyses for Highway Improvements* updated to current costs. It was estimated that there would be 3,869,365 fewer stops for Alternative No. 1; 1,832,665 fewer stops for Alternative No. 2, and 1,404,155 fewer stops for Alternative No. 3. Savings in stops were computed to be \$143,167 for Alternative No. 1; \$67,809 for Alternative No. 2 and \$51,954 for Alternative No. 3.

(3) Driver Benefits

In addition to vehicle operation, benefits are also accrued due to driver and occupants saving travel time and having an improved level of travel comfort and convenience. Time savings were estimated at \$.065 per minute per vehicle by updating the value of time contained in the *Road User Benefit Analyses* report to current costs. Time savings per year were estimated at 1,286,421 vehicle minutes for Alternative No. 1; 2,836,488 vehicle minutes for Alternative No. 2, and 603,078 vehicle minutes for Alternative No. 3. Table 7 shows the benefits due to time savings. The dollar amount of time savings were computed to be \$63,617 for Alternative No. 1; \$184,372 for Alternative No. 2 and \$39,200 for Alternative No. 3.

Comfort and convenience benefits for people traveling on the Havre bypass were estimated at \$.0125 per vehicle mile. The travel savings were estimated at 4,968,837 vehicle miles for Alternative No. 1; 6,406,369 vehicle miles for Alternative No. 2 and 3,428,525 vehicle miles for Alternative No. 3. Comfort and convenience benefits for people traveling on Fifth Avenue were estimated to be \$.001 per vehicle mile per percent change in traffic volume. Total comfort and convenience savings were estimated to be \$194,567 for Alternative No. 1; \$265,424 for Alternative No. 2 and \$143,470 for Alternative No. 3.

(4) Safety Benefits

Benefits due to safety are determined from the anticipated change in accidents that would occur if the bypass route were constructed. Savings per accident were obtained from current figures available from the National Safety Council. Estimates for number of accidents were

obtained from accident record files at the City Police Department for the three-year period 1976 through 1979. In those sections of road outside the City limits, vehicle accident records were not available and average accident rates obtained from the Department of Highways were used.

Cost per accident type obtained from the National Safety Council and the annual frequency of type of accident occurring on average urban two-lane streets and rural two-lane roads in Montana are as follows:

Type of Accident	Cost Per Accident	Frequency of Accident	
		Urban 2-lane	Rural 2-lane
Fatality	\$ 150,000	1.0	1.0
Injury	5,800	25.0	19.6
Property Damage	150,000	40.0	27.7

The average cost for an urban two-lane street is \$4,985 and the average cost of a rural two-lane road is \$5,947.

An investigation on the actual accidents occurring on Fifth Avenue from the Lutheran Home to U.S. 2, and on U.S. 2 from Fifth Avenue to Fourteenth Avenue was conducted for the three-year period from November, 1976 through October, 1979. The annual average number of accidents was 20.33 injury and 55.67 property damage on Fifth Avenue, and 5.67 injury and 28.33 property damage accidents on U.S. 2. There were no fatalities.

To compare the accidents that would occur without the arterial to the accidents that would occur with the arterial, estimates of the daily vehicle miles of travel on the various segments of affected roadway were calculated. These travel estimates are shown for the year 1979 and for the year 2000 in Table 5. In addition to the accident calculations, this table shows the impact of the three alternatives on traffic volumes on Fifth Avenue and U.S. 2.

The information was used to calculate the change in accidents on these various segments of roadway. In addition, it was determined that without the arterial and with expected development occurring in the southeast area of Havre, an additional 3.1604 million vehicle miles (MVM) of travel would be generated on the local street system if no arterial were constructed.

Table 6 shows the "change" in the number of accidents that would occur during the average year for the design period. Accidents on Fifth Avenue and U.S. 2 were estimated by using an actual accident rate of 13.66 accidents per MVM of travel for Fifth Avenue and 13.37 accidents per MVM of travel for U.S. 2. An average of these two figures was used for local streets. A state average of 3.00 accidents per MVM of travel for rural arterials was used for rural segments of U.S.2 and the southeast arterial and a state average of 1.24 for urban arterials was used for urban segments of the southeast arterial. Also included in the table are the cost per accident and the accident savings for each alternative.

TABLE 5
VEHICLE MILES OF TRAVEL
(MVM of Travel/Yr.)
(% Change)

	<u>YEAR 1979</u>				<u>YEAR 2000</u>			
	No Arterial	Alt. 1	Alt. 2	Alt. 3	No Arterial	Alt. 1	Alt. 2	Alt. 3
<u>Fifth Avenue</u> (Lutheran Home to U.S. 2)	5.5631	4.5548 (-18.1%)	4.6766 (-15.9%)	5.4151 (-2.7%)	10.0075	7.3452 (-26.6%)	7.5463 (-24.6%)	8.7268 (-12.8%)
<u>U.S. 2</u> (5th Avenue to 14th Avenue)	2.5432	2.6148 (+2.8%)	2.3969 (-5.8%)	2.5092 (-1.3%)	4.2279	4.1604 (-1.6%)	3.2704 (-22.7%)	3.4003 (-19.6%)
<u>U.S. 2</u> (14th Avenue to County Road)	1.9164	1.9605 (+2.3%)	1.8805 (-1.9%)	1.8919 (-1.3%)	3.5911	3.5165 (-1.8%)	3.1481 (-12.1%)	3.2776 (-8.5%)

TABLE 6
CHANGE IN TRAVEL AND ACCIDENT SAVINGS

Road Section	Accident Rate/MVM	Cost Per Accident	Alternate No. 1			Alternate No. 2			Alternate No. 3		
			Change in Travel (MVM)	Change in Accidents	Accident Savings (\$)	Change in Travel (MVM)	Change in Accidents	Accident Savings (\$)	Change in Travel (MVM)	Change in Accidents	Accident Savings (\$)
5th Avenue	13.66	4473	1.744	23.82	106,547	1.580	21.59	96,572	0.607	8.30	37,126
U.S. 2 (5th to 14th)	13.37	3972	-0.020	-0.27	-1,072	0.484	6.47	25,699	0.355	4.75	18,867
U.S. 2 (14th to Co. Rd.)	3.00	4984	-0.008	-.03	-150	0.192	.58	2,891	0.135	.40	1994
Local Roads	13.50	4985	0.735	9.92	49,451	1.170	15.80	78,763	1.110	14.99	74,725
Southeast Arterial (Urban)	1.24	4985	-3.667	-4.55	-22,682	-2.997	-3.72	-18,544	-.985	-1.22	-6,082
Southeast Arterial (Rural)	3.00	5969	-	-	-	-1.798	-5.39	-32,173	-1.836	-5.51	-32,889
Total Alt. 1			\$132,094			Total Alt. 2			Total Alt. 3		

(5) Drainage Benefits

The residential area around Fourteenth Avenue near U.S. 2 has flooding problems virtually every year. As part of the proposed improvements for two of the three alternatives, drainage improvements are planned for this area. The drainage improvements consist of five blocks of storm drain in Fourteenth Avenue and seven blocks of storm drain on Second Street to the Milk River outfall at Seventh Street.

These drainage improvements were deemed beneficial to residents in the area where the storm drains would reduce the flood hazard. Within the area of influence, 187 residences were estimated to benefit.

The benefits were quantified by obtaining the average cost of an insurance claim for flood damage from the Federal Flood Insurance Agency in Washington, D.C. The assumption was made that each residence within the area would have an average of one claim every twenty years. Using the average claim of \$4,519 for the 187 residences with an average of one claim in a twenty-year period, the annual average drainage benefit is \$40,250.

(6) Land Access Benefits

In addition to providing an arterial for through traffic, the Havresoutheast arterial will provide arterial access to adjacent local streets that would otherwise be difficult to reach. These benefits are presumed to be incurred by land not currently being served by an arterial street.

The area benefit was assumed to be equal to the depth of a five-acre square parcel or a depth of 1043.5 feet on each side of the arterial. The benefits were estimated to be \$300 per acre per year for the area benefitted, which does not include Fourteenth Avenue. Land access benefits using these figures are \$140,100 for Alternative No. 1; \$264,534 for Alternative No. 2 and \$172,866 for Alternative No. 3.

As a comparison, these costs were compared to the cost of a residential street. It was found that the benefits estimated are approximately equal to the cost of an average residential street to a depth of one lot. The benefits attributed to land access, therefore, are considered to be quite conservative.

(7) Annual Benefits

On the basis of the previous analysis, the benefits that have been identified have been assigned specific dollar amounts. The detailed calculations used to determine these benefits are on file at the Montana Department of Highways, Consultant Design Section. These benefits are shown as annual benefits, as is customary for this type of analysis.

Table 7 summarizes the annual benefits that were specifically identified for the three alternatives for the Havre Southeast Arterial.

C. BENEFIT - COST RATIOS

Using the costs to construct and maintain the three alternatives with the benefits associated with each alternative, a ratio of the benefits to the costs can be calculated. These benefit/cost ratios are indicators of the relative merits of each proposed improvement in relation to the costs. However, these ratios should be interpreted with caution. While the costs associated with each alternative can be estimated fairly closely, the benefits identified may not be all-inclusive. The benefits that have been identified are those that could be quantified with rationale, and benefits in dollar amounts calculated. Certain other benefits (and in certain cases costs) fall into the realm of "intangibles". Consideration of these intangibles, which include environmental effects, neighborhood disruption, displacement, rural land parcel and ownership divisions to mention a few, is no less important than the tangible effects. A report on environmental assessments has been prepared in addition to this report to insure that these impacts have been considered.

The benefit/cost ratios for each alternative based on the benefits identified and the estimated costs are as follows:

Alternative No. 1	$\frac{\text{Benefits } (\$684,088)}{\text{Costs } (\$315,216)}$	=	2.17
Alternative No. 2	$\frac{\text{Benefits } (\$891,977)}{\text{Costs } (\$463,530)}$	=	1.92
Alternative No. 3	$\frac{\text{Benefits } (\$413,662)}{\text{Costs } (\$326,056)}$	=	1.27

TABLE 7
ESTIMATED ANNUAL BENEFITS

ANNUAL BENEFIT	ALTERNATIVE NO.		
	1	2	3
Travel Savings	\$ 53,143	\$ 86,992	\$ 88,475
Stop Savings	143,167	67,809	51,954
Time Savings	83,617	184,372	39,200
Comfort and Convenience	194,567	265,424	143,470
Accident Reduction	106,749	126,841	58,799
Storm Drain Benefits	42,250	42,250	—
Land Access Benefits	140,100	264,534	172,866
Total Annual Benefits	\$684,088	\$891,977	\$413,662

CHAPTER VIII

Summary, Conclusions and Recommendations

- A. SUMMARY
- B. CONCLUSIONS
- C. RECOMMENDATIONS



CHAPTER VIII

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

A. SUMMARY

This Location Study Report contains a description of the methods and procedures used in conducting the Havre Southeast Arterial Location Study, and the results of the analyses conducted. The function of the Consultant in this project was to provide factual information to the local agencies on the feasible alternatives that would accomplish the purpose of this arterial route. The final decision on the selected route is a local prerogative with concurrence by the Montana Department of Highways.

One of the difficulties in conducting a study such as this is the difference in opinion on the function of the arterial route. On one hand, the route could be considered to be primarily for bypass traffic, including farm vehicles and trucks. On the other hand, the arterial route could be considered to be primarily an urban arterial with a predominance of local traffic. The alternatives that were developed attempted to satisfy these diversified functions to the extent possible, but it is obvious that each alternative cannot completely satisfy both of these functions. For this reason it may be logical that a compromise of these functions would be the best solution.

The primary factors to be weighed by the local agencies in selecting a final route include the benefit/cost analysis, environmental considerations, public acceptance and community needs. This information has been compiled and presented in this report and the Havre Southeast Arterial Environmental Assessment Report.

B. CONCLUSIONS

The analyses presented in this report were intended to identify which of the alternatives that were identified is the most desirable. Because of the substantial difference in the nature of the three alternatives, this comparison was difficult to do in a legitimate manner. The best information available has been used, and it is felt that the analytical techniques are sound. However, we would be less than candid if we failed to point out the weaknesses in the analysis. In particular, we would like to mention that the accident rates used for the accident analysis varied widely. This occurred because the actual accident rates on existing streets that were analyzed in Havre were much higher than the state average. Since both existing and state average rates were used in the analysis, some distortion in the results may be occurring in this area. However, since state averages were used for all three alternatives, the distortion between alternatives should not be of great significance.

During the performance of this location study it became apparent that Havre is badly in need of an urban arterial in this section of the community. The traffic effects are beginning to be felt already, and the expected development in the area will increase the need for an arterial route. As more development occurs in this area, it will become increasingly more difficult and expensive to

construct an arterial street. It is in the best interests of the Havre area to proceed with the project in the near future.

C. RECOMMENDATIONS

After a thorough review of the alternatives considered and much discussion about the purpose of the arterial route, we have concluded that Alternative No. 2 would provide the people of Havre with the best service. Our reasoning is that the purpose of the arterial route is to provide the function of land access as well as a bypass. There are no other arterials of consequence in the area, and future development dictates that an arterial is needed. It is conceded that there will be increased traffic on Fourteenth Avenue with some disruption to the neighborhood. However, the leg extending from Fourteenth Avenue to Clear Creek Road and then along Roller Coaster Road to U.S. 2 will provide relief from heavy vehicular traffic using Fourteenth Avenue as a bypass. This route will provide a desirable bypass route that will not penetrate existing neighborhoods while still providing arterial access to the area. The benefit/cost ratio for this alternative is an indication of the return on investment that Havre will realize. Alternative No. 2 also provides the best relief for traffic congestion now occurring on Fifth Avenue. This congestion is expected to continue to get worse, and relief will be needed within the design period.

Alternative No. 1 was considered to be inferior to Alternative No. 2 because it did not provide relief from the heavy traffic that would have to travel through the residential section of Fourteenth Avenue. In addition, the benefits from this route in comparison to the costs were not considered to be significantly better than Alternative No. 2.

Alternative No. 3 does not fulfill the land access function and will not serve the traffic need of the area nearly as well as Alternative 2, as evidenced by its low benefit/cost ratio. In addition, the tee intersections that would be created by the alternatives are undesirable from a traffic efficiency standpoint.

In recommending Alternative No. 2 we recognize that a petition has been signed by approximately 210 citizens of Havre stating:

"We, the undersigned registered voters and electors, residents of Havre, Hill County, Montana, do hereby protest the construction of a "Loop Road" incorporating Fourteenth Avenue and support the planners' proposition no. 3."

The concern of these residents is acknowledged and appreciated. Virtually every major community in Montana has had similar situations, and decisions of this nature are difficult to make. However, substantial benefits will be incurred by the residents along Fourteenth Avenue to mitigate the impacts of increased traffic. These include the construction of a new street with curb and gutters and sidewalks, and a new storm drain system to alleviate the problem of flooding that has plagued the

northern end of Fourteenth Avenue. These improvements would be done with Federal Aid Urban funds, and the residents would not have the burden of a Special Improvement District. In addition, the section of the arterial route from Fourteenth Avenue to Clear Creek Road and then along Roller Coaster Road to U.S. 2 would carry the truck traffic, and only automobiles would be traveling on Fourteenth Avenue. Since Fourteenth Avenue is a designated Federal Aid Urban route and functionally classified as a minor arterial, Havre has previously committed this street as an arterial route. Therefore, no change in transportation policy would be necessary to include this route as part of the arterial route.

It is recommended that all of the alternatives under consideration have access limited to street intersections. This restriction will preserve the integrity of the traffic characteristics of the roadway, and will discourage undesirable strip development along the arterial. Traffic projections and capacity calculations indicate that a two-lane facility would be adequate for the planning period.

With these previous commitments, compensations and mitigating measures, we believe that Alternative No. 2 would provide the most effective addition to the transportation system in Havre.

APPENDIX A

Public Meeting Summary



ROBERT PECCIA & ASSOCIATES

HAVRE SOUTH ARTERIAL LOCATION STUDY

Public Meeting
September 19, 1979

This special public meeting was held by Robert Peccia and Associates on Wednesday, September 19, 1979 at 7:00 p.m. in the City Council Chambers at City Hall in Havre.

Barry Damschen introduced Doug Widmayer and Mike Money who are associated with Robert Peccia and Associates. Doug explained the three alternates and Barry Damschen opened the meeting to questions, answers and comments.

Mr. Pete Hamilton (former Mayor of Havre) started the meeting with the first question directed to Barry Damschen. Mr. Hamilton wanted to correct Barry on his first statement about the alternate studies. Pete said that this study was not made in the last year and a half, but was made quite a few years ago (about 1968 or 1969) by the City-County Planning Board and at that time, they were interested in Alternate No. 1 which was to go up Fourteenth Avenue, through the coulee and then over to what is now the new high school. The purpose of this alternate was to alleviate traffic on Fifth Avenue; however, it was never developed. Mr. Hamilton wanted to see Alternate 1 used because he felt it was probably one of the best alternates for alleviating traffic on Fifth Avenue. He also asked about the plans that Robert Peccia & Associates had for widening the streets and removing boulevards if they used Alternate 1.

Barry Damschen answered Mr. Hamilton by telling him that Robert Peccia & Associates have not completed the trip generation analysis and they do not know how many vehicles would be using that street. However, it is possible that Fourteenth Avenue would have to be widened to a certain degree and boulevards would have to be removed and asphalt repaved.

Elmer Strissel, who lives near Fourteenth Avenue, asked if both of the boulevards on Fourteenth Avenue would have to be removed.

Doug Widmayer told Mr. Strissel that this would be a design decision which would be made later.

Elmer then asked how much they were planning on widening Fourteenth Avenue.

Doug told him it would depend on what they feel will be the projected traffic volume on the road.

Steve Kologi (Department of Highways Preconstruction Bureau Chief) told the audience that the width of the street would depend on how the people who lived on Fourteenth Avenue felt about parking.

Pete Hamilton then asked Steve about the width of Fourteen Avenue at the present time, and Steve said it was approximately 60 feet wide.

Pete then mentioned that there could be two-way traffic and parking on both sides of the street.

Barry told him that this option would depend on the number of vehicles — if there were a large number of vehicles, traffic and parking lanes would have to be widened, but if there are fewer vehicles, a narrower street would be feasible.

Barry told the audience that Mr. Kologi mentioned that the big issue is parking, and whether it should be allowed on both sides of the street, one side only, or not at all. Barry said that if there was to be no parking on Fourteenth Street, widening the street would probably not be necessary.

Chad Eddiin asked if the consultants were taking into consideration the future of this county with respect to small cars, or if they planned only for big cars.

Barry told him that in design, whether for a wastewater facility or a new highway, an engineer must take into consideration what has happened in the past and what is happening at the present time. He also told Mr. Eddiin that the consultants would use the design standards that are currently in effect.

Someone in the audience asked if large-size passenger cars are expected in future years.

Steve Kologi answered that he feels there will be more small cars in the future than now, but that trucks are not getting any smaller now and most likely will not in the future. There may be a tendency toward larger size for trucks, buses, etc., so streets will have to be designed for them also. Even if the cars do become smaller, it does not necessarily follow that the streets can be built narrower.

Doug Ross wanted to know what the reasoning behind all the alternates was; to reduce traffic on Fifth Avenue or to bypass the city.

Barry told Mr. Ross that the goal of the project is to evaluate the existing problems and to try to solve them, and that the consultants are looking at both situations.

Dave Snowdy (who owns property south of the new high school in Havre) said that there are several families who live south of the high school who have no access road to and from the downtown area. He didn't care where the bypass went as long as there was access to the area of his home south of the high school.

Herbert Coddens asked if the preliminary engineering included storm drainage and sewers for Fourteenth Avenue, should it be used.

Barry said that if the selected alternate goes down Fourteenth Avenue, during the preliminary design stage they would look at several things, including the possibility of a storm drainage system.

Herbert Coddens then voted in favor of Alternate 1.

Lloyd Kelly asked if this project would be a State Highway Project, and Steve Kologi told him that it could be, but it depended on whether it was funded with local or state money.

Lloyd Kelly then asked how the project would be financed.

Steve told Mr. Kelly that the local officials would have to decide if there was enough money in their urban fund which was not already earmarked for some other project within the urban area. If the funds were available, they could establish a priority for the expenditure of that money to build this particular route, assuming that it is within the urban limits. If it extends outside the urban limits, it would have to be labeled a secondary route, and the county would have to fund it from their secondary fund. However, if the City and County felt that this route was needed immediately and there were not enough urban funds available, the route could be built with either a City-wide or an area-wide S.I.D.. The City and County could raise the funds themselves, but if help from the State was needed, it must be requested from urban funds; therefore, the route would have to be built within urban limits.

Lloyd Kelly said that he had seen some type of proposal on this in the past (the bypass route that Mr. Hamilton had mentioned earlier) in which there was a loop all the way around the city, covering the west half as well as the east half. Mr. Kelly wondered why this route had been dropped and why only half of it was being considered now.

Barry told Mr. Kelly that, according to the information he had, the application to the Department of Highways included study area boundaries on the east half of the city only. This application was filed jointly by the City and the County.

Pete Hamilton felt that the immediate question was whether the community wanted a total bypass or a route that would alleviate traffic on Fifth Avenue. He was in favor of alleviating traffic on Fifth Avenue.

Steve Kologi told the audience that he felt the word bypass was a poor term to use since the route would actually be strictly a local arterial to serve the southeast part of Havre, and not a route for the large truck traffic on U. S. 2 or state traffic.

Betty Lou Burgland (part owner of Glo-Ed Development) asked if the route would be a truck bypass. She was not in favor of a truck bypass because of all the traffic it would generate and the subsequent danger to children.

Steve Kologi told Betty Lou that the route would be used by local cars and trucks, since it would be an arterial route.

Betty Lou then asked how much truck traffic would use the arterial.

Steve said that truck traffic is one of the things that will be analyzed in the study.

Barry mentioned that the study is incomplete at this time, but that they will do a trip generation analysis and determine traffic volumes for each alternate.

Dr. Russ Carlson (representing the Havre Public Schools) told how the Trustees of the Havre Public Schools felt about the alternates. The Trustees felt that none of the alternates would relieve the congestion on Fifth Avenue. They oppose Alternate 1 because the road would go down the middle

of the School Board property (possible site of a junior high school). They would also oppose Alternate 2 because it would also split the school site and, in addition, it planned a feeder line near the Sunny Side School, so there would be hazardous roads on each side of the school for children to cross. The School Trustees favored Alternate 3 because this alternate would skirt the edge of the school site on the east side of town; however, they would like to see the connector to Fifth Avenue located not as far south as on Alternates 2 and 3. They would like to see the southern end of the loop road connect to Fifth Avenue as shown in Alternate 1, thereby giving more access to the high school.

Pastor Dave Larson (Representative of the Lutheran Home of the Good Shepherd) mentioned that they would oppose Alternate 1 because of where it would enter Fifth Avenue. They have been looking into expanding the facilities of the home, and Alternate 1 would ruin any plans to expand, and therefore limit their ability to serve the community.

Barry commented that these alternates could be modified.

Ray Johnston said he would favor Alternate 3 because he travels Fourteenth Avenue every day. He would not like to think of that street having any more traffic on it than there already is.

Chad Eddian then asked if the location of the dead end on Fifth Avenue limited the options for the loop road on the west side.

Barry told Mr. Eddian that it would, to a certain degree. The consultants would have to analyze the land use and to see what options were feasible.

Doug Ross asked where Alternate 1 would end.

Doug told Mr. Ross that it would end on the Beaver Creek Road directly across from the 70-foot drainage easement between the two subdivisions.

Doug Ross then asked whether Alternate 2 ended near the flood drainage dam across from the Beaver Creek Road.

Doug Widmayer told Mr. Ross that it would end north of the retention basin that is on the west side of Beaver Creek Road and that it would be located north of the dam.

Bob Keeler mentioned that he favored Alternate 2, and asked for comment from the Mayor of Havre and the County Commissioners because the paper had reported that the County Commissioners favored Alternate 3 and the City of Havre wanted Alternate 1.

Dan Morse (one of the County Commissioners) said they favored Alternate 3 because it utilized municipal property and connected with only one avenue of the city. Dan added that the Commissioners will consider all the possibilities.

Mayor Norse Hyatt (Mayor of Havre, speaking for the City of Havre) chose Alternate 1 because it would best relieve traffic on Fifth Avenue. He said that time is a factor to everyone in Havre, and

that Fourteenth Avenue is already one-way parking. He said we would have to live with this route twenty years from now, and felt it would be the best choice.

Dan Morse then said that money is a factor and asked how long it would take to get the funding for this project.

Barry answered that it depends on what priority is assigned to the project by the local officials.

Waldo Spangelo (Attorney) asked about bicycle and jogging trails.

Steve Kologi answered Mr. Spangelo by saying that there are highway funds for such improvements, and that they will be considered.

Dan Morse commented about the meeting and said that he learned a great deal.

Doug Ross commented that he felt that making Fifth Avenue one way and Sixth Avenue one way would solve many of the traffic congestion problems on Fifth Avenue.

Barry Damschen closed the meeting by thanking everyone for coming and sharing their views.

APPENDIX B

Construction Cost Estimates



ROBERT PECCIA & ASSOCIATES

•HELENA•HAVRE•

HAVRE SOUTH ARTERIAL LOCATION STUDY ALTERNATE 1

BY: D. Widmayer

DATE: Nov. 14, 1979

ENGINEER'S ESTIMATE

SHEET 1 OF 2

Item No.	Quantity	Unit	Item Description	Unit Price	Total Price
1.	184,000	CY	Unclassified Excavation	\$2.00	\$368,000.00
2.	3,000	LF	Sidewalk Removal	\$5.00	15,000.00
3.	4,950	LF	Curb Removal	\$5.30	26,235.00
4.	70	Ea.	Tree Removal	\$75.00	5,250.00
5.	LS	LS	14th Ave. Drainage System (12 blocks w/1 M.H. and 4 inlets per block)	LS	480,000.00
6.	680	LF	24" RCP (Class 2)	\$30.00	20,400.00
7.	80	LF	30" RCP (Class 2)	\$43.00	3,440.00
8.	LS	LS	100 LF of 4' x 3' Box Culvert (with wing walls and approach pads)	LS	10,500.00
9.	48,011	Tons	1½" Minus Crushed Granular Base (25,952 CY)	\$5.00	240,055.00
10.	9,106	Tons	Asphalt Base Course	\$22.00	200,332.00
11.	5,722	Tons	Asphalt Surface Course	\$22.00	125,884.00
12.	964	Tons	Asphalt Cement 120 - 150	\$175.00	168,700.00
13.	57	Tons	Prime Coat MC - 70	\$175.00	9,975.00
14.	5,390	Gal.	Tack Coat SS - 1h	\$1.25	6,738.00
15.	23,000	LF	Curb and Gutter	\$9.00	207,000.00
16.	2,056	SY	Sidewalk 5'wide, 4" deep	\$15.00	30,840.00
17.	13	Ea.	Water Valve Adjustment	\$150.00	1,950.00
18.	13	Ea.	M.H. Adjustment	\$300.00	3,900.00
19.	153	Gal.	Paint (Striping)	\$20.00	3,060.00
20.	22	Ea.	Traffic Control Signs	\$200.00	4,400.00
21.	9,000	CY	Topsoil (Salvaging and Placing)	\$2.50	22,500.00
22.	192	Lbs.	Seeding	\$5.00	960.00
23.	960	Lbs.	Fertilizing	\$1.00	960.00

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HAVRE SOUTH ARTERIAL LOCATION STUDY ALTERNATE 1

BY: D. Widmayer

DATE: Nov. 14, 1979

ENGINEER'S ESTIMATE

SHEET 2 OF 2

[illegible]

ROBERT PECCIA & ASSOCIATES

-HELENA-HAVRE-

HAVRE SOUTH ARTERIAL LOCATION STUDY ALTERNATE 2

BY: D. Widmayer

DATE: Nov. 14, 1979

ENGINEER'S ESTIMATE

SHEET 1 OF 2

Item No.	Quantity	Unit	Item Description	Unit Price	Total Price
1.	325,250	CY	Unclassified Excavation	\$2.00	\$650,500.00
2.	3,000	LF	Sidewalk Removal	\$5.00	15,000.00
3.	4,950	LF	Curb Removal	\$5.30	26,235.00
4.	70	Ea.	Tree Removal	\$75.00	5,250.00
5.	LS	LS	14th Avenue Drainage System (12 blocks with 1 M.H. and 4 inlets per block)	LS	480,000.00
6.	880	LF	24" RCP (Class 2)	\$30.00	26,400.00
7.	120	LF	30" RCP (Class 2)	\$43.00	5,160.00
8.	80	LF	36" RCP (Class 2)	\$62.00	4,960.00
9.	LS	LS	100 LF of 4' x 3' box culvert (with wing walls and approach pads)	LS	10,500.00
10.	LS	LS	100 LF of twin 6' x 5' box culverts (with wing walls and approach pads)	LS	35,000.00
11.	89,163	Tons	1½" Minus Crushed Granular Base (48,196 CY)	\$5.00	445,815.00
12.	10,627	Tons	Asphalt Surface Course	\$22.00	233,794.00
13.	16,913	Tons	Asphalt Base Course	\$22.00	372,086.00
14.	1,790	Tons	Asphalt Cement 120 - 150	\$175.00	313,250.00
15.	106	Tons	Prime Coat MC - 70	\$175.00	18,550.00
16.	10,011	Gal.	Tack Coat SS - 1h	\$1.25	12,514.00
17.	17,250	LF	Curb and Gutter	\$9.00	155,250.00
18.	2,056	SY	Sidewalk 5' wide, 4" thick	\$13.50	27,756.00
19.	13	Ea.	Water Valve Adjustment	\$150.00	1,950.00
20.	13	Ea.	M.H. Adjustment	\$300.00	3,900.00
21.	284	Gal.	Paint (Striping)	\$20.00	5,680.00
22.	27	Ea.	Traffic Control Signs	\$200.00	5,400.00
23.	15,500	CY	Topsoil (Salvaging and Placing)	\$2.50	38,750.00

HAVRE SOUTH ARTERIAL LOCATION STUDY

ALTERNATE 2

D. Widmayer

Nov. 14, 1979

ENGINEER'S ESTIMATE

SHEET 2 OF 2

[illegible]

ROBERT PECCIA & ASSOCIATES

•HELENA•HAVRE•

HAVRE SOUTH ARTERIAL LOCATION STUDY ALTERNATE 3

BY: D. Widmayer

DATE: Nov. 14, 1979

ENGINEER'S ESTIMATE

SHEET 1 OF 1

Item No.	Quantity	Unit	Item Description	Unit Price	Total Price
1.	410,000	CY	Unclassified Excavation	\$2.00	\$820,000.00
2.	LS	LS	100 LF of 4' x 3' Box Culvert (with wingwalls and approach pads)	LS	10,500.00
3.	LS	LS	100 LF of twin 6' x 5' Box Culverts (with wingwalls and approach pads)	LS	35,000.00
4.	800	LF	24" RCP (Class 2)	\$30.00	24,000.00
5.	80	LF	36" RCP (Class 2)	\$62.00	4,960.00
6.	72,951	Tons	1½" Minus Crushed Granular Base (39,433 CY)	\$5.00	364,755.00
7.	13,838	Tons	Asphalt Base Course	\$22.00	304,436.00
8.	8,695	Tons	Asphalt Surface Course	\$22.00	191,290.00
9.	1,465	Tons	Asphalt Cement 120 - 150	\$175.00	256,375.00
10.	87	Tons	Prime Coat MC-70	\$175.00	15,225.00
11.	8,191	Gal.	Tack Coat SS - 1h	\$1.25	10,239.00
12.	232	Gal.	Paint (Striping)	\$20.00	4,640.00
13.	19	Ea.	Traffic Control Signs	\$200.00	3,800.00
14.	14,100	CY	Topsoil (Salvaging and Placing)	\$2.50	35,250.00
15.	288	Lbs.	Seeding	\$5.00	1,440.00
16.	1,440	Lbs.	Fertilizing	\$1.00	1,440.00
			Miscellaneous (10 percent)		208,335.00
			Administrative, Legal, Engineering and Contingencies (20 percent)		416,670.00
			TOTAL --		\$2,708,355.00

